AIWA®

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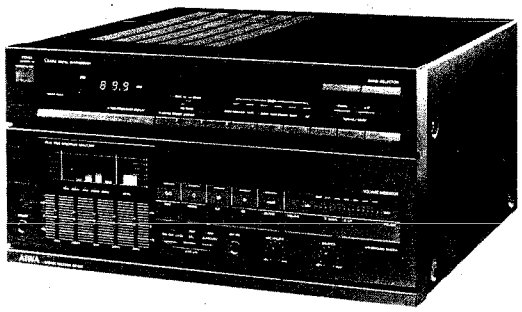
SERVICE MANUAL

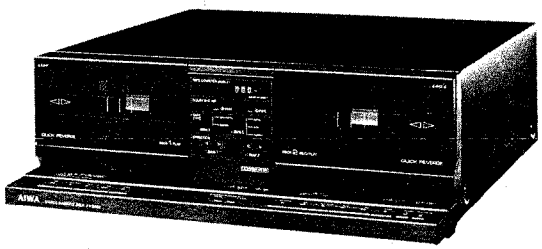
MODEL NO. RX-990



■STEREO RECEIVER

■TYPE. HB, UB, EB, KB, ZB

MODEL NO. FX-W990



■STEREO CASSETTE DECK

■TYPE. Y

■BASIC MECHANISM: X-3

■ CU-990 is the system up name of RX-990 and FX-W990.

■ CP-990 is the system up name of RX-990, FX-W990 and LX-E990.

AIWA Co., Ltd. Tokyo Japan

Printed in Japan

SPECIFICATIONS

(RX-990)

<Common>

Power requirements	RX-990H 120 V/220 V/240 V switchable 50/60 Hz RX-990U 120 V 60 Hz RX-990E, Z 220 V 50/60 Hz RX-990K 240 V 50/60 Hz
Power consumption	RX-990E, K, Z 230 W (System total 260 W) RX-990H 105 W (System total 130 W) RX-990U 115 W (System total 135 W)
Dimensions	330(W) × 169.5(H) × 310.5(D) mm
Weight	5.8 kg
Accessories	FM feeder antenna (except Z model) AM loop antenna

<Amplifier section>

Power output	RX-990E, K, Z 35 W + 35 W (6 ohms, T.H.D. 1%, 1 kHz) RX-990H 50W + 50 W (6 ohms, EIAJ) <FTC Rule U model only> 35 Watts per channel, Min. RMS at 6 ohms, from 40 Hz—20 kHz, with no more than 1% Total Harmonic Distortion.
Power bandwidth (IHF)	20 Hz—50 kHz
Signal-to-noise ratio	88 dB
Output terminals	
SPEAKERS	6—16 ohms
HEADPHONES	8 ohms
Input terminals (Sensitivity/impedance)	
PHONO	200 mV/22 kohms
CD/DAT/VCR/TAPE	150 mV/47 kohms
Output terminals (Level/impedance)	
REC OUT	130 mV/39 kohms

<FM section>

Frequency range	FM: 87.5 MHz to 108 MHz
Usable sensitivity (IHF)	3,1 μV (300 ohms) 15,2 dBf
Alternate channel selectivity	52 dB (±400 kHz)
Signal-to-noise ratio	77 dB (MONO)
Image response ratio	50 dB
Frequency response	30 Hz to 15 kHz (+0.5, −1.5 dB)
Stereo separation	35 dB at 1 kHz
Antenna	75 ohms (unbalanced) 300 ohms (balanced) (except Z model)

<AM section>

Frequency range	AM: 530 kHz to 1,605 kHz
AM sensitivity	RX-990H, U 300 μV/m RX-990E, K, Z 500 μV/m
Selectivity	50 dB (100 dB input)
Antenna	Loop antenna

<LW section> (E, K, Z model only)

Frequency range	LW: 150 kHz to 285 kHz
AM sensitivity	800 μV/m
Antenna	Loop antenna

(FX-W990)

Type	Stereo cassette tape deck
Track format	4 tracks, 2 channels
Frequency response	METAL tape: 20—17,000 Hz CrO_2 tape: 20—16,000 Hz NORMAL tape: 20—15,000 Hz
Signal-to-noise ratio	73 dB (METAL tape DOLBY C NR ON)
Wow and flutter	According to DIN 45 500 0.1% 0.055% (WRMS)
Tape speed	4.8 cm/sec. (1-7/8 ips), 9.5 cm/sec (Double speed)
Rewind time	90 sec. (C-60)
Fast forward time	90 sec. (C-60)
Recording system	AC bias
Erase system	AC erase
Motor	DC Servomotor ×2
Heads	Playback head ×1 (Deck 1) Record/playback head ×1 (Deck 2) Erase head ×1 (Deck 2)
Inputs	Standard input Level: 210 mV
Outputs	Standarad output level: 210 mV (0 VU)
Dimensions	330(W) × 116(H) × 346(D) mm
Weight	3.7 kg

- Design and specifications are subject to change without notice.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the □□ symbol are trademarks of Dolby Laboratories Licensing Corporation.

■ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	ORDER	DESCRIPTION	COMMON MODEL	Q, TY
	1	*81-724-906-010	J	INSTRUCTION BOOKLET	*	1
	2	*81-748-632-010	J	FM FEEDER ANTENNA N (EXCEPT Z)		1
	3	*81-792-014-010	J	REMOTE CONTROLLER RC-T990FYB (H,U ONLY)		1
	4	*81-792-012-018	G	REMOTE CONTROLLER RC-T990LYBNE (E,K,Z ONLY)		1
	5	*87-032-845-010	J	SIEMENS PLUG (H ONLY)		1
	6	*87-043-092-010	J	LOOP ANTENNA (S)		1

RX-990

DISASSEMBLY INSTRUCTIONS

1. Removing Front Cabinet

1) Remove 5 screws Ⓐ holding the front cabinet and the red screws Ⓑ holding the front circuit board.
2) Release 11 tabs and remove the front cabinet.

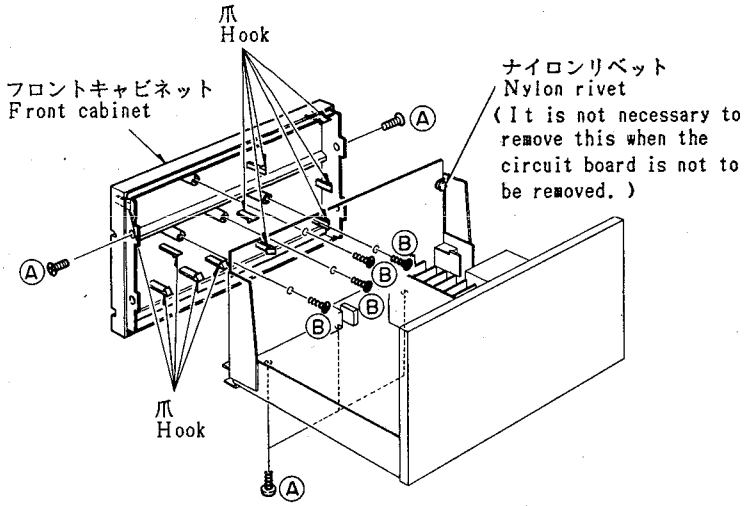
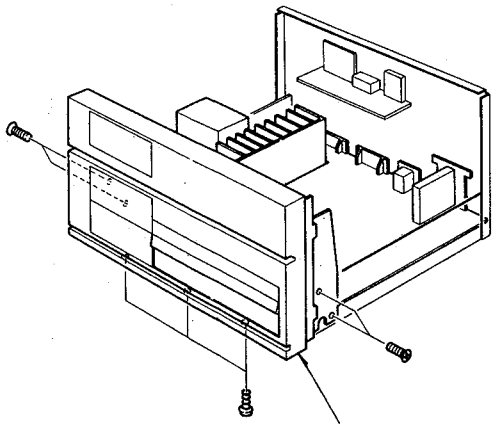


Fig. 1

2. Removing Main CB

1) Remove the 7 screws. (See Figure-2)

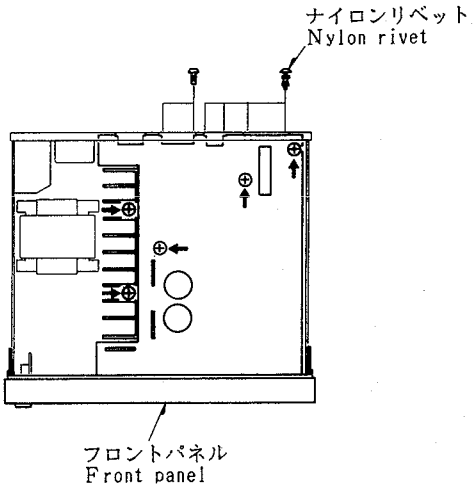


The main circuit board can be removed without disassembling the front cabinet. (It is not necessary to remove it from the front circuit board.)

Fig. 2

2) Remove 7 screws and 4 nylon rivets, then take out the main circuit board in the direction of the arrow. (See Figure-3)

Move the tabs of the heat sink slightly for easier access.



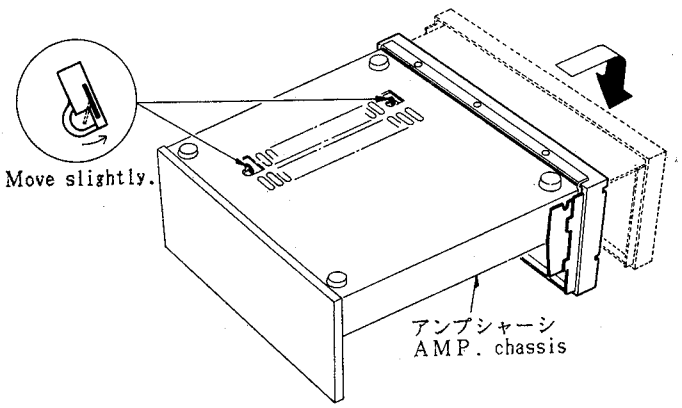


Fig. 3

ELECTRICAL MAIN PARTS LIST (RX-990)

※ Please order the all parts for this model to Japan.

REF. No.	PART No.	DESCRIPTION
		=== IC ===
	87-020-873	IC,4066 BH
	87-027-350	IC,IR2406G
	87-020-858	IC,LA1177
	87-020-566	IC,LA1265
	87-020-547	IC,LB1292
	87-020-877	IC,LC4966
	87-020-859	IC,LC7217
	87-020-701	IC,M4013
	87-027-895	IC,M5218L
	87-020-904	IC,M5227
	87-020-548	IC,M5228P
	81-789-601	IC,M50761-433S
	87-020-379	IC,MN6632
	87-027-867	IC,TA7343 AP
	87-027-978	IC,TC9152P
	87-027-897	IC,UPC1225H
	87-027-787	IC,UPC1237H
	87-020-538	IC,UPC1474HA
	81-020-815	IC,UPD7528 ACU-204
		=== TRANSISTOR ===
	89-501-615	FET,2SK161GR
	89-502-415	FET,2SK241GR
	89-502-465	FET,2SK246GR
	89-502-464	FET,2SK246Y
	89-026-269	TRANSISTOR,DTA114ES
	87-026-215	TRANSISTOR,DTC114YS
	89-109-525	TRANSISTOR,2SA952K
	89-110-155	TRANSISTOR,2SA1015,GR
	89-206-882	TRANSISTOR,2SB688
	89-211-853	TRANSISTOR,2SB1185F
	89-309-456	TRANSISTOR,2SC945L,P
	89-318-155	TRANSISTOR,2SC1815GR
	89-318-154	TRANSISTOR,2SC1815Y
	89-320-011	TRANSISTOR,2SC2001K
	89-326-553	TRANSISTOR,2SC2655 O
	89-327-594	TRANSISTOR,2SC2759-L(U23)
	89-407-182	TRANSISTOR,2SD718
	89-417-613	TRANSISTOR,2SD1761F
	89-417-650	TRANSISTOR,2SD1765
		=== MAIN CIRCUIT BOARD SECTION ===
PCB-A	*	MAIN CIRCUIT BOARD
⚠	★ 87-033-147	FUSE CLAMP
BFU1	★ 82-794-670	CF BFU450C4N
BPF1	★ 87-030-134	BPF FILTER BPM B7A (Z ONLY)
C1	★ 87-018-044	CAP,CERA-SOL S 1000P
C2	★ 87-010-379	CAP,ELECT 22-16SME
C3	★ 87-018-040	CAP,CERA-SOL S 470P
C4	★ 87-010-404	CAP,ELECT 4.7-50SME
C5	★ 87-010-404	CAP,ELECT 4.7-50SME
C7	★ 87-010-384	CAP,ELECT 100-25SME
C10	★ 87-010-391	CAP,ELECT 10-35SME
C11	★ 87-010-391	CAP,ELECT 10-35SME
C21	★ 87-010-378	CAP,ELECT 10-16SME
C28	★ 87-010-260	CAP,ELECT 47-25SME
C31	★ 87-010-404	CAP,ELECT 4.7-50SME
C32	★ 87-010-404	CAP,ELECT 4.7-50SME
C34	★ 87-010-391	CAP,ELECT 10-35SME
C35	★ 87-010-378	CAP,ELECT 10-16SME
C36	★ 87-010-378	CAP,ELECT 10-16SME
C38	★ 87-010-564	CAP,ELECT 100-16KS
C38	★ 87-010-564	CAP,ELECT 100-16KS
C39	★ 87-010-564	CAP,ELECT 100-16KS
C61	★ 87-010-401	CAP,ELECT 1-50SME
C62	★ 87-010-401	CAP,ELECT 1-50SME
C63	★ 87-018-195	CAP,CERA-SOL SS 1200P
C64	★ 87-018-195	CAP,CERA-SOL SS 1200P
C67	★ 87-018-008	CAP,CERA-SOL S 8.2P
C68	★ 87-018-008	CAP,CERA-SOL S 8.2P
C69	★ 87-010-401	CAP,ELECT 1-50SME
C70	★ 87-010-401	CAP,ELECT 1-50SME
C80	★ 87-010-391	CAP,ELECT 10-35SME
C81	★ 87-018-033	CAP,CERA-SOL S 120P
C82	★ 87-018-033	CAP,CERA-SOL S 120P
C83	★ 87-010-402	CAP,ELECT 1-50SME
C84	★ 87-010-402	CAP,ELECT 2.2-50SME
C85	★ 87-010-401	CAP,ELECT 1-50SME
C86	★ 87-010-401	CAP,ELECT 1-50SME
C94	★ 87-010-258	CAP,ELECT 22-33SME
C96	★ 87-010-391	CAP,ELECT 10-35SME
C98	★ 87-018-046	CAP,CERA-SOL S 4700P
C99	★ 87-018-044	CAP,CERA-SOL S 1000P
C101	★ 87-018-042	CAP,CERA-SOL S 680P
C102	★ 87-018-042	CAP,CERA-SOL S 680P
C104	★ 87-010-404	CAP,ELECT 4.7-50SME
C105	★ 87-010-378	CAP,ELECT 10-16SME
C106	★ 87-010-378	CAP,ELECT 10-16SME
C107	★ 87-010-074	CAP,ELECT 4.7-35
C108	★ 87-010-074	CAP,ELECT 4.7-35
C110	★ 87-010-401	CAP,ELECT 1-50SME
C111	★ 87-018-044	CAP,CERA-SOL S 1000P
C112	★ 87-010-385	CAP,ELECT 220-25SME
C114	★ 87-010-403	CAP,ELECT 3.3-50SME
C115	★ 87-010-378	CAP,ELECT 10-16SME
C117	★ 87-018-002	CAP,CERA-SOL S 2.2P
C118	★ 87-018-002	CAP,CERA-SOL S 2.2P
C119	★ 87-018-012	CAP,CERA-SOL S 15P
C120	★ 87-018-012	CAP,CERA-SOL S 15P
C131	★ 81-542-640	CAP,ELECT 6800-35V (U ONLY)
C131	★ 87-010-582	CAP,ELECT 4700-35V (H,E,K,Z ONLY)
C132	★ 81-542-640	CAP,ELECT 6800-35V (U ONLY)
C132	★ 87-010-582	CAP,ELECT 4700-35V (H,E,K,Z ONLY)
C135	★ 87-010-396	CAP,ELECT 470-35SME
C136	★ 87-010-396	CAP,ELECT 470-35SME
C137	★ 87-010-384	CAP,ELECT 100-25SME
C138	★ 87-010-384	CAP,ELECT 100-25SME
C138	★ 87-010-384	CAP,ELECT 100-25SME
C139	★ 87-010-260	CAP,ELECT 47-25SME
C140	★ 87-010-402	CAP,ELECT 2.2-50SME
C141	★ 87-010-263	CAP,ELECT 100-10
C144	★ 87-015-914	CAP,ELECT 47-100V
C145	★ 87-015-914	CAP,ELECT 47-100V
C146	★ 87-010-394	CAP,ELECT 220-35SME
C147	★ 87-010-391	CAP,ELECT 10-35SME
C150	★ 87-010-389	CAP,ELECT 2200-25SME
C151	★ 87-010-258	CAP,ELECT 22-35SME
C152	★ 87-010-391	CAP,ELECT 10-35SME
C153	★ 87-010-404	CAP,ELECT 4.7-50SME
C153	★ 87-010-404	CAP,ELECT 4.7-50SME
C154	★ 87-010-378	CAP,ELECT 10-16SME
C155	★ 87-010-391	CAP,ELECT 10-35SME
C156	★ 87-010-265	CAP,ELECT 33-16SME
C425	★ 87-018-047	CAP,CERA-SOL S 0.01Y/16
C426	★ 87-018-047	CAP,CERA-SOL S 0.01Y/16
C427	★ 87-018-144	CAP,CERA-SOL S 100P

※ Please order the all parts for this model to Japan

REF. No.		PART No.	DESCRIPTION
C428	★	87-018-144	CAP,CERA-SOL S 100P
C429	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C430	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C431	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C432	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C433	★	87-018-028	CAP,CERA-SOL 68P
C435	★	87-010-404	CAP,ELECT 4.7-50SME
C501	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C501	★	87-010-401	CAP,ELECT 1-50SME
C502	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C504	★	87-010-379	CAP,ELECT 22-16SME
C505	★	87-018-038	CAP,CERA-SOL S 330P
C506	★	87-010-402	CAP,ELECT 2.2-50SME
C507	★	87-010-402	CAP,ELECT 2.2-50SME
C508	★	87-010-402	CAP,ELECT 2.2-50SME
C509	★	87-010-402	CAP,ELECT 2.2-50SME
C510	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C512	★	87-010-403	CAP,ELECT 3.3-50SME
C514	★	87-010-378	CAP,ELECT 10-16SME
C515	★	87-010-404	CAP,ELECT 4.7-50SME
C516	★	87-010-378	CAP,ELECT 10-16SME
C517	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C520	★	87-010-401	CAP,ELECT 1-50SME
C521	★	87-010-403	CAP,ELECT 3.3-50SME
C522	★	87-010-248	CAP,ELECT 220-10SME
C523	★	87-014-057	CAP,PP 1000P
C524	★	87-010-378	CAP,ELECT 10-16SME
C525	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C526	★	87-010-402	CAP,ELECT 2.2-50SME
C527	★	87-010-402	CAP,ELECT 2.2-50SME
C543	★	87-010-402	CAP,ELECT 2.2-50SME
C544	★	87-010-402	CAP,ELECT 2.2-50SME
C551	★	89-663-705	CAP,CERA-SOL 3300P (E,K,Z ONLY)
C552	★	87-010-401	CAP,ELECT 1-50SME
C553	★	87-018-047	CAP,CERA-SOL S 0.01Y/16 (E,K,Z ONLY)
C555	★	87-018-047	CAP,CERA-SOL S 0.01Y/16 (E,K,Z ONLY)
C556	★	87-010-544	CAP,ELECT 0.1-50 (E,K,Z ONLY)
C557	★	87-010-401	CAP,ELECT 1-50SME (H,U ONLY)
C557	★	87-010-544	CAP,ELECT 0.1-50 (E,K,Z ONLY)
C558	★	87-014-050	CAP,PP 510P
C559	★	87-018-018	CAP,CERA-SOL S 27P (H,U ONLY)
C559	★	87-018-110	CAP,CERA-SOL S 24P (E,K,Z ONLY)
C560	★	87-014-049	CAP,PP 470P
C561	★	89-018-121	CAP,CERA-SOL S 150P (E,K,Z ONLY)
C563	★	87-018-047	CAP,CERA-SOL S 0.01Y/16 (H ONLY)
C564	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C565	★	87-015-962	CAP,ELECT 0.22-50SME
C566	★	87-010-404	CAP,ELECT 4.7-50SME
C567	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C568	★	87-018-018	CAP,CERA-SOL S 27P
C569	★	87-010-252	CAP,ELECT 1000-6.3
C570	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C571	★	87-010-378	CAP,ELECT 10-16SME
C572	★	87-010-246	CAP,ELECT 47-35SME
C573	★	87-010-384	CAP,ELECT 100-25SME
C574	★	87-010-374	CAP,ELECT 47-10
C575	★	87-018-033	CAP,CERA-SOL S 120P
C576	★	87-018-033	CAP,CERA-SOL S 120P
C577	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C578	★	87-010-401	CAP,ELECT 1-50SME
C579	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C580	★	87-018-047	CAP,CERA-SOL S 0.01Y/16
C581	★	87-010-379	CAP,ELECT 22-16SME
CF500	★	87-008-335	CF 10.7 MAS-H (EXCEPT Z)
CF500	★	87-785-669	CF 10.7MA8H-R (Z ONLY)
CF501	★	81-701-642	FILTER CFLZ-450A
CL502	★	+++	FILTER CFLZ-450A
D1		87-027-225	DIODE,ZENER 05Z-5.1X(TP)
D2		87-020-691	DIODE 1SS132
D21		87-020-691	DIODE 1SS132
D22		87-020-691	DIODE 1SS132
D23		87-020-691	DIODE 1SS132
D31		87-020-691	DIODE 1SS132
D45		87-020-691	DIODE 1SS132
D46		87-020-691	DIODE 1SS132
D47		87-020-691	DIODE 1SS132
D48		87-020-691	DIODE 1SS132
D49		87-020-691	DIODE 1SS132
D50		87-027-555	DIODE,ZENER HZ5C2
D51		87-027-555	DIODE,ZENER HZ5C2
D52		87-027-393	DIODE,ZENER HZ4C2
D53		87-020-691	DIODE 1SS132
D54		87-020-691	DIODE 1SS132
D55		87-020-691	DIODE 1SS132
D56		87-020-691	DIODE 1SS132
D57		87-020-691	DIODE 1SS132
D58		87-027-393	DIODE,ZENER HZ4C2
D59		87-020-691	DIODE 1SS132
D60		87-027-369	DIODE,ZENER 05Z-6.2L
D61		87-020-691	DIODE 1SS132
D63		87-020-400	DIODE 1SR35-200
D64		87-020-400	DIODE 1SR35-200
D65		87-020-691	DIODE 1SS132
D71		87-020-144	DIODE DBA4DC
D72		87-020-691	DIODE 1SS132
D73		87-020-691	DIODE 1SS132
D75		87-027-376	DIODE 1B4B41
D76		87-020-691	DIODE 1SS132
D77		87-027-475	DIODE,ZENER HZ-6B1
D78		87-027-475	DIODE,ZENER HZ-6B1
D80		87-027-474	DIODE,ZENER HZ11A2
D81		87-020-691	DIODE 1SS132
D82		87-020-400	DIODE 1SR35-200
D83		87-027-323	DIODE,ZENER HZ22-2L
D84		87-020-400	DIODE 1SR35-200
D85		87-020-144	DIODE DBA4DC
D87		87-020-691	DIODE 1SS132
D89		87-027-475	DIODE,ZENER HZ-6B1
D91		87-027-301	DIODE,ZENER HZ3A1 (H,U ONLY)
D91		87-020-691	DIODE 1SS132 (E,K,Z ONLY)
D95		87-027-347	DIODE,ZENER HZ18-2L T2
D96		87-020-691	DIODE 1SS132
D200		87-020-691	DIODE 1SS132
D201		87-020-691	DIODE 1SS132
D202		87-020-691	DIODE 1SS132
D204		87-027-475	DIODE,ZENER HZ-6B1
D205	★	81-754-634	DIODE,VAR KV1260
D206		87-020-691	DIODE 1SS132
D207		87-020-691	DIODE 1SS132
D208		87-020-691	DIODE 1SS132
D209		87-020-691	DIODE 1SS132
D220		87-020-691	DIODE 1SS132
⚠F2		87-035-254	FUSE 2.5A (H,U ONLY)
⚠F2		87-035-366	FUSE T2.5A (E,K,Z ONLY)
J1	★	87-032-985	SOCKET DIN 8P
J4	★	87-049-659	SOCKET BP 13P (DECK)
J5		87-049-661	JACK 6.3HLJ4316 (MIX MIC)
J6	★	87-049-660	SOCKET 10P (DECK REMOCON)
J11	★	81-754-629	CONNECTOR 2P (AM LOOP)

※ Please order the all parts for this model to Japan.

REF. No.		PART No.	DESCRIPTION
J12	★	81-749-631	ANT TERMINAL ASSY (H,U ONLY)
J12	★	81-033-193	ANT TERMINAL ASSY (E ONLY)
J12	★	81-033-194	ANT TERMINAL ASSY (K ONLY)
L1	★	87-005-153	COIL 47UH
L250	★	87-003-051	COIL 470UH
L500	★	81-754-638	COIL QUAD (P)
L501	★	81-754-639	COIL QUAD (S)
L503	★	82-794-697	FILTER,BIRDY ABS-7 (Z ONLY)
L505	★	87-008-253	LPF
L507	★	87-006-136	COIL ANT MW (H,U ONLY)
L507	★	87-006-137	COIL ANT MW (E,K,Z ONLY)
L508	★	87-794-223	COIL OSC MW PS (H,U ONLY)
L508	★	87-794-687	COIL OSC MW (E,K,Z ONLY)
L509	★	87-006-138	COIL ANT LW (E,K,Z ONLY)
L510	★	87-794-688	COIL OSC LW (E,K,Z ONLY)
L520	★	87-003-051	COIL 470UH
R195	★	87-025-393	RES,CEMENT 2W-0.22
R196	★	87-025-393	RES,CEMENT 2W-0.22
R197	★	87-025-393	RES,CEMENT 2W-0.22
R198	★	87-025-393	RES,CEMENT 2W-0.22
⚠R246	★	87-029-089	RES,FUSIBLE 1/4W 4.7
⚠R256	★	87-029-023	RES,FUSIBLE 47
⚠R273	★	87-029-089	RES,FUSIBLE 1/4W 4.7
⚠R275	★	87-029-023	RES,FUSIBLE 47
⚠R295	★	87-029-108	RES,FUSIBLE 1-1/2W
⚠R296	★	87-029-108	RES,FUSIBLE 1-1/2W
⚠R303	★	87-029-115	RES,FUSIBLE 10 1/4W
⚠R304	★	87-029-070	RES,FUSIBLE 2.2 1/2W
RA1	★	81-783-669	RES,ARRAY 6P
RA2	★	81-783-670	RES,ARRAY 10P
RL1		87-045-251	RELAY G5R-12V
SFR500	★	87-021-742	SFR 10K
SW1-1		81-783-627	PUSH SW (REC OUT G.EQ)
SW1-2		81-783-627	PUSH SW (DSL)
SW1-3		81-783-627	PUSH SW (SURROUND)
SW500		82-795-624	SLIDE SW (AM STEP) (H ONLY)
TC500	★	87-011-131	TRIMMER 30P
TC501	★	87-011-131	TRIMMER 30P
TH1	★	82-304-722	THERMISTOR 42D26
TH2	★	82-304-722	THERMISTOR 52D26
VR1		87-021-921	VOLUME 10KB (MIC VOLUME)
VR2		87-021-922	VOLUME 50KW (BALANCE)
X201	★	87-008-236	CERAMIC RESONATOR CSB400P
X202	★	87-030-122	CRYSTAL 7.2MHZ
☲☲ KEY SWITCH CIRCUIT BOARD SECTION ☲☲			
PCB-B		*	KEY SWITCH CIRCUIT BOARD
C3	★	87-010-251	CAP,ELECT 10-35VSRE
C5	★	87-010-251	CAP,ELECT 10-35VSRE
C7	★	87-010-074	CAP,ELECT 4.7-35
C8	★	87-010-074	CAP,ELECT 4.7-35
C9	★	87-018-040	CAP,CERA-SOL S 470P
C10	★	87-018-040	CAP,CERA-SOL S 470P
C13	★	87-010-072	CAP,ELECT 2.2-50
C14	★	87-010-072	CAP,ELECT 2.2-50
C17	★	87-010-070	CAP,ELECT 0.47-50
C18	★	87-010-070	CAP,ELECT 0.47-50
C23	★	87-018-197	CAP,CERA-SOL SS 1800P
C24	★	87-018-197	CAP,CERA-SOL SS 1800P
C27	★	87-018-041	CAP,CERA-SOL S 560P
C28	★	87-018-041	CAP,CERA-SOL S 560P
C31	★	87-018-047	CAP,CERA-SOL S 0.01Y
C32	★	87-018-047	CAP,CERA-SOL S 0.01Y
C41	★	87-010-074	CAP,ELECT 4.7-35
C42	★	87-010-264	CAP,ELECT 100-10 SRE
C46	★	87-010-070	CAP,ELECT 0.47-50
C53	★	87-010-070	CAP,ELECT 0.47-50
C57	★	87-010-070	CAP,ELECT 0.47-50
C62	★	87-010-070	CAP,ELECT 0.47-50
C65	★	87-018-036	CAP,CERA-SOL S 220P
C66	★	87-018-036	CAP,CERA-SOL S 220P
C67	★	87-010-070	CAP,ELECT 0.47-50
C68	★	87-010-264	CAP,ELECT 100-10 SRE
C70	★	87-010-070	CAP,ELECT 0.47-50
C74	★	87-010-251	CAP,ELECT 10-35
C75	★	87-010-380	CAP,ELECT 47-25SRE
C76	★	87-010-251	CAP,ELECT 10-35VSRE
C80	★	87-010-075	CAP,ELECT 10-16
C434	★	87-018-047	CAP,CERA-SOL S 0.01Y
C600	★	87-010-075	CAP,ELECT 10-16
C601	★	87-018-020	CAP,CERA-SOL S 33P
C603	★	87-010-252	CAP,ELECT 1000-6.3
C605	★	87-010-075	CAP,ELECT 10-16
C606	★	87-010-075	CAP,ELECT 10-16
C607	★	87-010-075	CAP,ELECT 10-16
C610	★	87-014-069	CAP,PP 3300P
C611	★	87-010-371	CAP,ELECT 470-6.3SME
C612	★	87-018-046	CAP,CERA-SOL S 4700P
D1		87-020-691	DIODE 1SS132
D2		87-020-691	DIODE 1SS132
D3		87-027-686	DIODE,ZENER HZ12A1
D4	★	87-027-542	LED LN217RP (REC OUT)
D5	★	87-027-542	LED LN217RP (DSL)
D6	★	87-027-542	LED LN217RP (SURROUND)
D7	★	87-020-872	LED BR0034 (MUTING)
D8	★	87-020-875	LED BG0034 (TAPE)
D9	★	87-020-875	LED BG0034 (PHONO)
D10	★	87-020-875	LED BG0034 (DAT/AUX)
D11	★	87-020-875	LED BG0034 (CD)
D12	★	87-020-876	LED LN7302P (VOLUME INDICATOR)
D21		87-020-691	DIODE 1SS132
D22		87-020-691	DIODE 1SS132
D23		87-020-691	DIODE 1SS132
D24		87-020-691	DIODE 1SS132
D25		87-020-691	DIODE 1SS132
D26		87-020-691	DIODE 1SS132
D28		87-027-416	DIODE,ZENER HZ3C2
D31		87-020-691	DIODE 1SS132
D32		87-020-691	DIODE 1SS132
D50		87-027-393	DIODE,ZENER HZ4C2
D221		87-020-691	DIODE 1SS132
D300		87-020-691	DIODE 1SS132 (E ONLY)
D301		87-020-691	DIODE 1SS132 (E,K,Z ONLY)
D302		87-020-691	DIODE 1SS132 (H,U ONLY)
D303		87-020-691	DIODE 1SS132 (H,U ONLY)
D305		87-020-691	DIODE 1SS132
D306		87-020-691	DIODE 1SS132
D307		87-020-691	DIODE 1SS132
D308		87-020-691	DIODE 1SS132
D309		87-020-691	DIODE 1SS132
D310		87-020-691	DIODE 1SS132
D311		87-020-691	DIODE 1SS132
D312		87-020-691	DIODE 1SS132
FL1	★	81-783-625	FL FV105 (SPECTRUM ANALYZER)
FL2	★	81-783-661	FL (DIGITAL SYNTHESIZER)
L302		87-003-045	INDUCTOR 22UH
L303		87-003-045	INDUCTOR 22UH

※ Please order the all parts for this model to Japan.

REF. No.		PART No.	DESCRIPTION
L600	★	81-783-656	COIL YX
L601	★	81-783-656	COIL YX
SW5		87-031-771	TACT SW (VOLUME DOWN)
SW6		87-031-771	TACT SW (VOLUME UP)
SW7		87-031-771	TACT SW (TAPE)
SW8		87-031-771	TACT SW (PHONO)
SW9		87-031-771	TACT SW (AUX)
SW10		87-031-771	TACT SW (CD)
SW11		87-031-771	TACT SW (MUTING)
SW600		84-722-613	SLIDE SW (FM MODE)
SW601		87-031-771	TACT SW (TIME SLLEP)
SW602		87-031-771	TACT SW (TIME/FREQUENCY)
SW603		87-031-771	TACT SW (TIME STANDBY)
SW604		87-031-771	TACT SW (TIME SET)
SW605		87-031-771	TACT SW (EVERY)
SW606		87-031-771	TACT SW (ONCE)
SW607		87-031-771	TACT SW (MEMORY)
SW608		87-031-771	TACT SW (TUN/TIME DOWN)
SW609		87-031-771	TACT SW (TUN/TIME UP)
SW610		87-031-771	TACT SW (FM)
SW611		87-031-771	TACT SW (AM) (H,U,C ONLY)
SW611		87-031-771	TACT SW (MW) (E,K,Z ONLY)
SW612		87-031-771	TACT SW (LW) (E,K,Z ONLY)
SW613		87-031-750	PUSH SW (POWER)
SW614		87-031-771	TACT SW (PRESET STATION 5)
SW615		87-031-771	TACT SW (PRESET STATION 6)
SW616		87-031-771	TACT SW (PRESET STATION 7)
SW617		87-031-771	TACT SW (PRESET STATION 8)
SW618		87-031-771	TACT SW (PRESET STATION 1)
SW619		87-031-771	TACT SW (PRESET STATION 2)
SW620		87-031-771	TACT SW (PRESET STATION 3)
SW621		87-031-771	TACT SW (PRESET STATION 4)
VR1		87-021-956	SLIDE VR 20KB (70HZ)
VR2		87-021-956	SLIDE VR 20KB (350HZ)
VR3		87-021-956	SLIDE VR 20KB (1KHZ)
VR4		87-021-956	SLIDE VR 20KB (3.5KHZ)
VR5		87-021-956	SLIDE VR 20KB (10KHZ)

=== DSL CIRCUIT BOARD SECTION ===

PCB-C		*	DSL CIRCUIT BOARD
C45	★	87-010-263	CAP,ELECT 100-10
C46	★	87-010-263	CAP,ELECT 100-10
C49	★	87-010-378	CAP,ELECT 10-16SME
C50	★	87-010-378	CAP,ELECT 10-16SME
C51	★	87-010-403	CAP,ELECT 3.3-50SME
C52	★	87-010-403	CAP,ELECT 3.3-50SME
C55	★	87-010-401	CAP,ELECT 1-50SME
D35		87-020-691	DIODE 1SS132
D36		87-020-691	DIODE 1SS132
D37		87-020-691	DIODE 1SS132
D38		87-020-691	DIODE 1SS132
D39		87-020-691	DIODE 1SS132
D40		87-020-364	DIODE,ZENER HZ-2B3

=== JACK-1 CIRCUIT BOARD SECTION ===

PCB-D		*	JACK-1 CIRCUIT BOARD
C12	★	87-010-401	CAP,ELECT 1-50SME
C13	★	87-010-401	CAP,ELECT 1-50SME
D5		87-020-691	DIODE 1SS132
D6		87-020-691	DIODE 1SS132
D7		87-020-691	DIODE 1SS132
D8		87-020-691	DIODE 1SS132
D9		87-020-691	DIODE 1SS132

D10		87-020-691	DIODE 1SS132
D11		87-020-691	DIODE 1SS132
D12		87-020-691	DIODE 1SS132
J2		87-049-450	PIN JACK 4P(REC OUT)
J8	★	82-795-613	SP TERMINAL 4P (SPEAKERS)
J9		87-049-507	JACK 3.5 (MIC) (SURROUND L)
J10		87-049-507	JACK 3.5 (MIC) (SURROUND R)
⚠R233	★	87-029-083	RES,FUSIBLE 1/2W-10
⚠R234	★	87-029-083	RES,FUSIBLE 1/2W-10

=== CD CONNECTOR CIRCUIT BOARD SECTION ===

PCB-E		*	CD CONNECTOR CIRCUIT BOARD
⚠	★	87-033-147	FUSE CLAMP
⚠F3		87-035-249	FUSE 1A (H,U ONLY)
⚠F3		87-035-362	FUSE T1A (E,K,Z ONLY)
⚠F4		87-035-249	FUSE 1A (H,U ONLY)
⚠F4		87-035-362	FUSE T1A (E,K,Z ONLY)
J3	★	87-049-659	SOCKET BP 13P (CD)

=== JACK-2 CIRCUIT BOARD SECTION ===

PCB-F		*	JACK-2 CIRCUIT BOARD
J7		87-049-846	JACK 6.3 2S
R231	★	87-025-311	RES,MFO 1W-220
R232	★	87-025-311	RES,MFO 1W-220

=== FUSE CIRCUIT BOARD SECTION ===

PCB-G		*	FUSE CIRCUIT BOARD
⚠	★	87-033-147	FUSE CLAMP
⚠F1		87-035-303	FUSE 4A (U ONLY)
⚠F1		87-035-365	FUSE T2A (E,K,Z ONLY)
⚠F7		87-035-254	FUSE 2.5A (H ONLY)
⚠F8		87-035-254	FUSE 2.5A (H ONLY)
⚠SW20		87-036-067	SLIDE SW (AC VOLTAGE) (H ONLY)

=== REMOTE SENSOR CIRCUIT BOARD SECTION ===

PCB-H		*	REMOTE SENSOR CIRCUIT BOARD
D313		87-020-536	DIODE,PHOTO PH-309 (REMOTE SENSOR)

=== FRONT END 1.2 CIRCUIT BOARD SECTION ===

PCB-I		81-783-652	FRONT END-1 CIRCUIT BOARD (EXCEPT Z
PCB-I		81-783-653	FRONT END-2 CIRCUIT BOARD (Z ONLY)
C400	★	87-018-104	CAP,CERA-SOL 10P
C401	★	87-018-100	CAP,CERA-SOL 4.7P
C402	★	87-018-134	CAP,CERA-SOL SS 0.01
C403	★	87-018-103	CAP,CERA-SOL 8.2P
C404	★	87-018-096	CAP,CERA-SOL 1P
C405	★	87-018-105	CAP,CERA-SOL 12P
C405	★	87-018-134	CAP,CERA-SOL SS 0.01 (Z ONLY)
C406	★	87-018-097	CAP,CERA-SOL 2.2P
C406	★	87-018-104	CAP,CERA-SOL 10P (Z ONLY)
C407	★	87-018-109	CAP,CERA-SOL 22P (Z ONLY)
C408	★	87-018-123	CAP,CERA-SOL 220P (Z ONLY)
C409	★	87-018-134	CAP,CERA-SOL SS 0.01
C411	★	87-018-105	CAP,CERA-SOL SS 12P
C413	★	87-018-108	CAP,CERA-SOL SS 20P
C414	★	87-018-134	CAP,CERA-SOL SS 0.01
C415	★	87-018-134	CAP,CERA-SOL SS 0.01 (Z ONLY)
C420	★	87-018-031	CAP,CERA-SOL 1000P
C421	★	87-018-131	CAP,CERA-SOL 1000P
C422	★	87-018-122	CAP,CERA-SOL 180P
C423	★	87-018-134	CAP,CERA-SOL SS 0.01
CF400	★	87-008-261	CF SFT-10.7MA5A (EXCEPT Z)
CF400	★	82-799-621	CF SFT-10.7MS2A (Z ONLY)

※ Please order the all parts for this model to Japan.

REF. No.		PART No.	DESCRIPTION
CF401	★	82-785-669	CF SFT-10.7MA8A (Z ONLY)
CT400	★	87-011-142	CAP,TRIMMER 10P
CT401	★	87-011-142	CAP,TRIMMER 10P
CT402	★	87-011-142	CAP,TRIMMER 10P (Z ONLY)
D400		87-020-858	DIODE 1SV124A
D401		87-020-691	DIODE 1SS132
D402		87-020-858	DIODE 1SV124A
D403		87-020-858	DIODE 1SV124A
D404		87-020-858	DIODE 1SV124A (Z ONLY)
L400	★	82-791-631	COIL FM ANT 4 (EXCEPT Z)
L401	★	82-791-630	COIL FM ANT 3
L402	★	87-007-232	COIL (EXCEPT Z)
L402	★	82-791-629	COIL FM ANT(U) (Z ONLY)
L403	★	87-007-231	COIL RF (EXCEPT Z)
L403	★	82-791-627	COIL RF (Z ONLY)
L404	★	87-007-232	COIL (EXCEPT Z)
L404	★	82-791-629	COIL FM ANT(U) (Z ONLY)
L405	★	82-791-629	COIL FM ANY(U) (Z ONLY)
L406	★	82-298-611	COIL (Z ONLY)
L407	★	82-794-683	IFT FM 6T
L408	★	81-783-675	COIL FM OSC EX (EXCEPT Z)
L408	★	81-783-671	COIL FM OSC (Z ONLY)

=== MISCELLANEOUS ===

⚠	★	87-034-732	AC CORD (H,U ONLY)
⚠	★	87-034-736	AC CORD (E,Z ONLY)
⚠	★	87-034-734	AC CORD (K ONLY)
⚠	★	87-085-184	AC CORD BUSHING (H,U ONLY)
⚠	★	87-085-185	AC CORD BUSHING (E,K,Z ONLY)
⚠	★	81-701-658	L-TYPE CABLE (Z ONLY)
⚠PT1	★	81-783-606	POWER TRANSFORMER (H ONLY)
⚠PT1	★	81-783-607	POWER TRANSFORMER (U ONLY)
⚠PT1	★	81-783-608	POWER TRANSFORMER (E,Z ONLY)
⚠PT1	★	81-783-609	POWER TRANSFORMER (K ONLY)
⚠SW21		87-036-066	SW SDDJ (POWER) (E,K,Z ONLY)

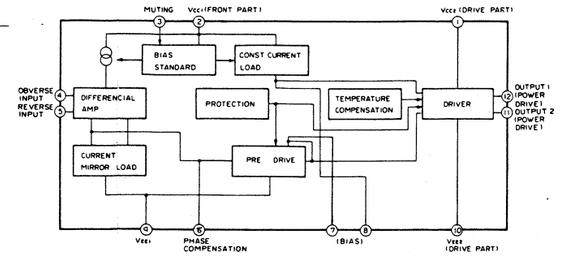
Please order the parts to Gwent factory.

Conbination circuit board A 81-783-610
PCB-A 81-783-611
PCB-C 81-783-616
PCB-D 81-783-612
PCB-E 81-783-615
PCB-F 81-783-613
PCB-G 81-783-614

Conbination circuit board B 81-783-620
PCB-B 81-783-621
PCB-H 81-783-622

IC BLOCK DIAGRAM (RX-990)

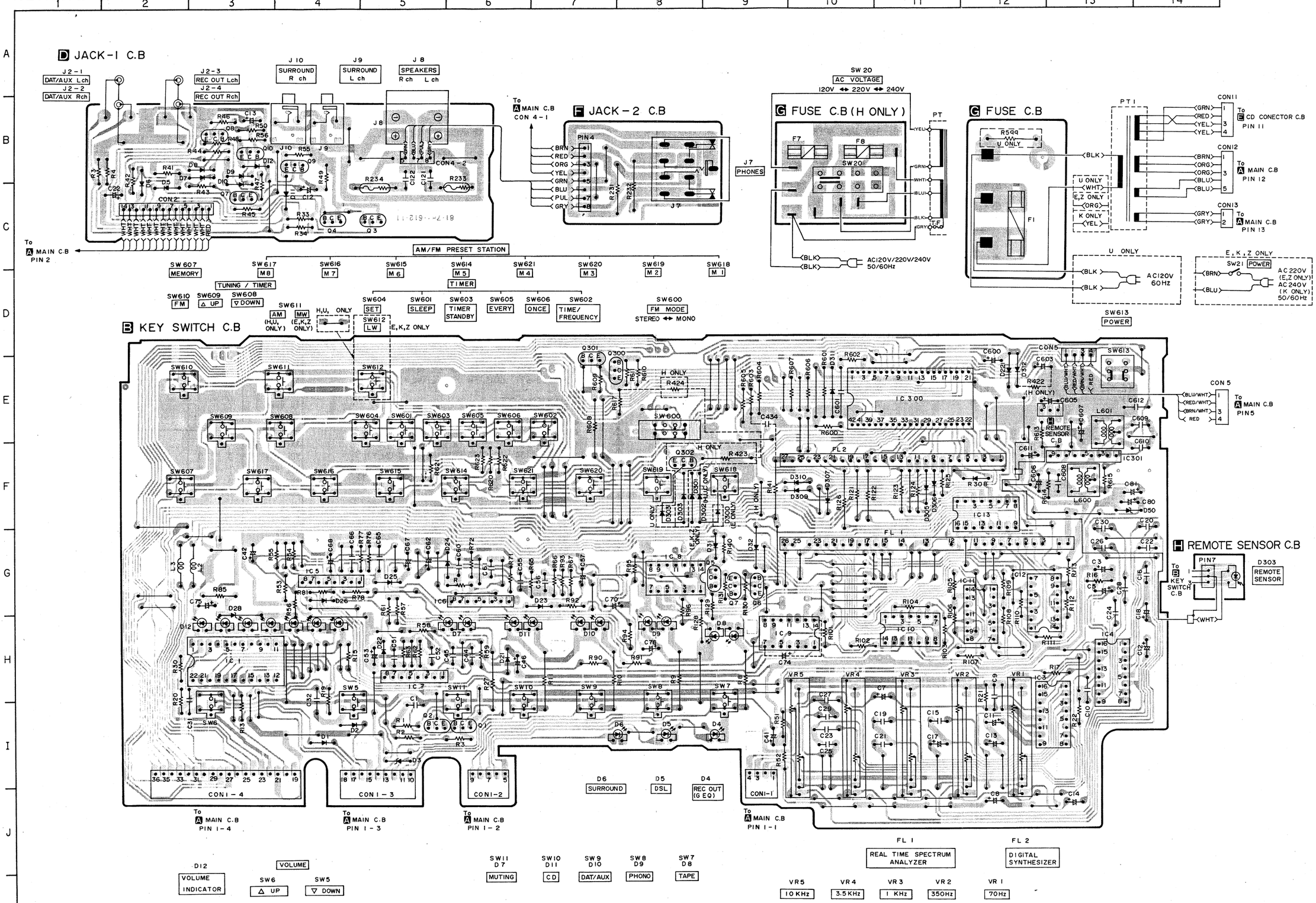
μPC1225H



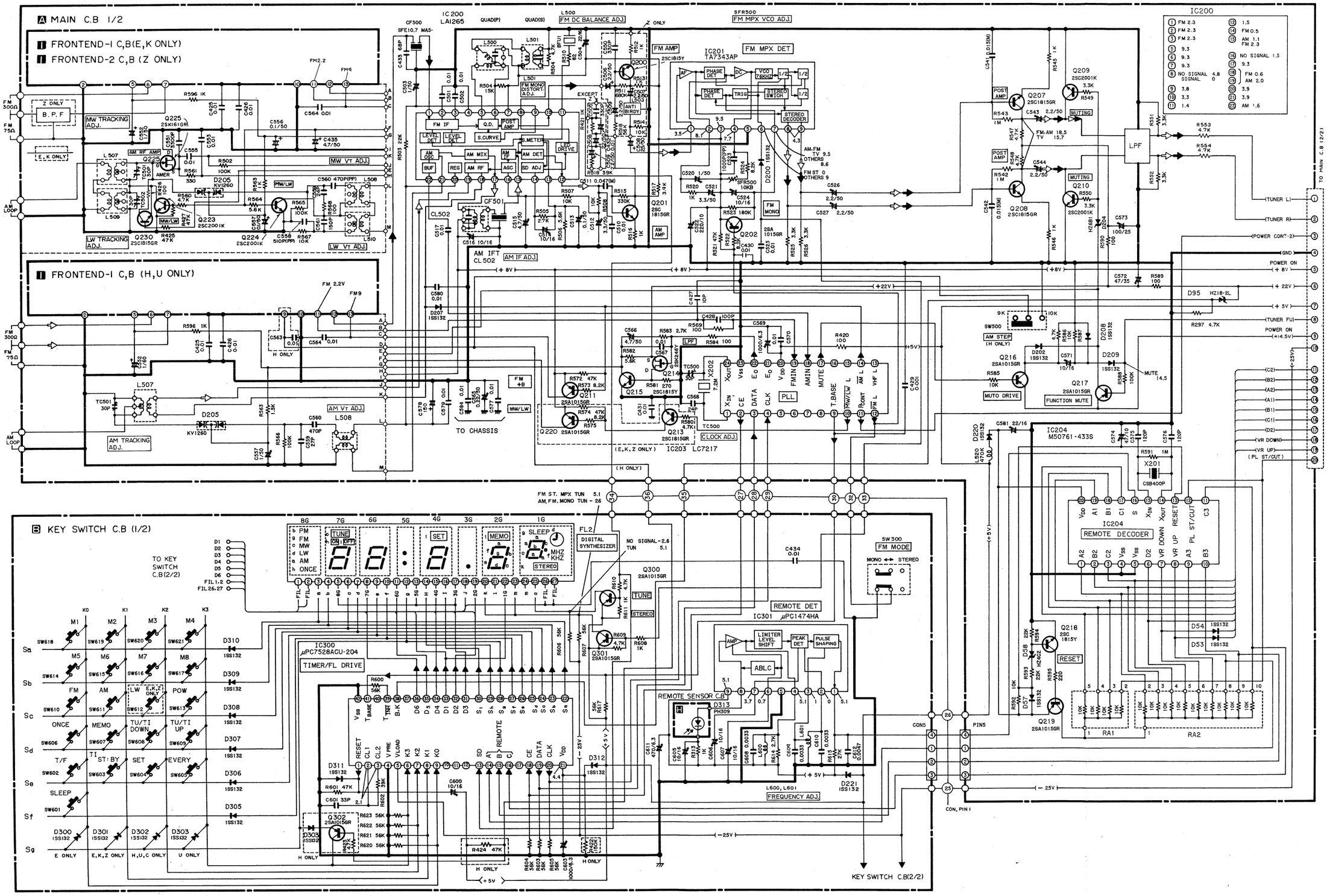
IC204 M50761-433S DECORD LIST

Pin No.	⑲ ⑱ ⑰	① ② ③ ⑥	⑨ ⑩ ⑪	⑫	⑦ ⑧
Mode	A_1 B_1 C_1	A_2 B_2 C_2 D_2	A_3 B_3 C_3	PL	Down μP
TUNER					
POWER			1 0 1		
FM			1 0 0		
AM			0 1 0		
LW			1 1 0		
TU DOWN			0 1 1		
TU UP			0 0 1		
AMP					
VOL DOWN	0 1 0				1 0
VOL UP	1 0 0				0 1
MUTE	0 0 1				0 0
DECK					
I FF		0 0 0 1			
I REW		0 0 1 1			
I PLAY		0 1 0 1			
I REV PLAY		1 0 0 1			
STOP		1 0 0 0			
II FF		1 0 1 0			
II REW		0 1 0 0			
II PLAY		0 0 1 0			
II REV PLAY		1 1 0 0			
II PAUSE		0 1 1 0			
II REC		1 1 1 0			
CD					
PLAY/PAUSE	1 1 0				
STOP	1 1 0				
B SKIP	1 1 1				
F SKIP	0 1 1				
PLAYER START/CUT				1	0 0

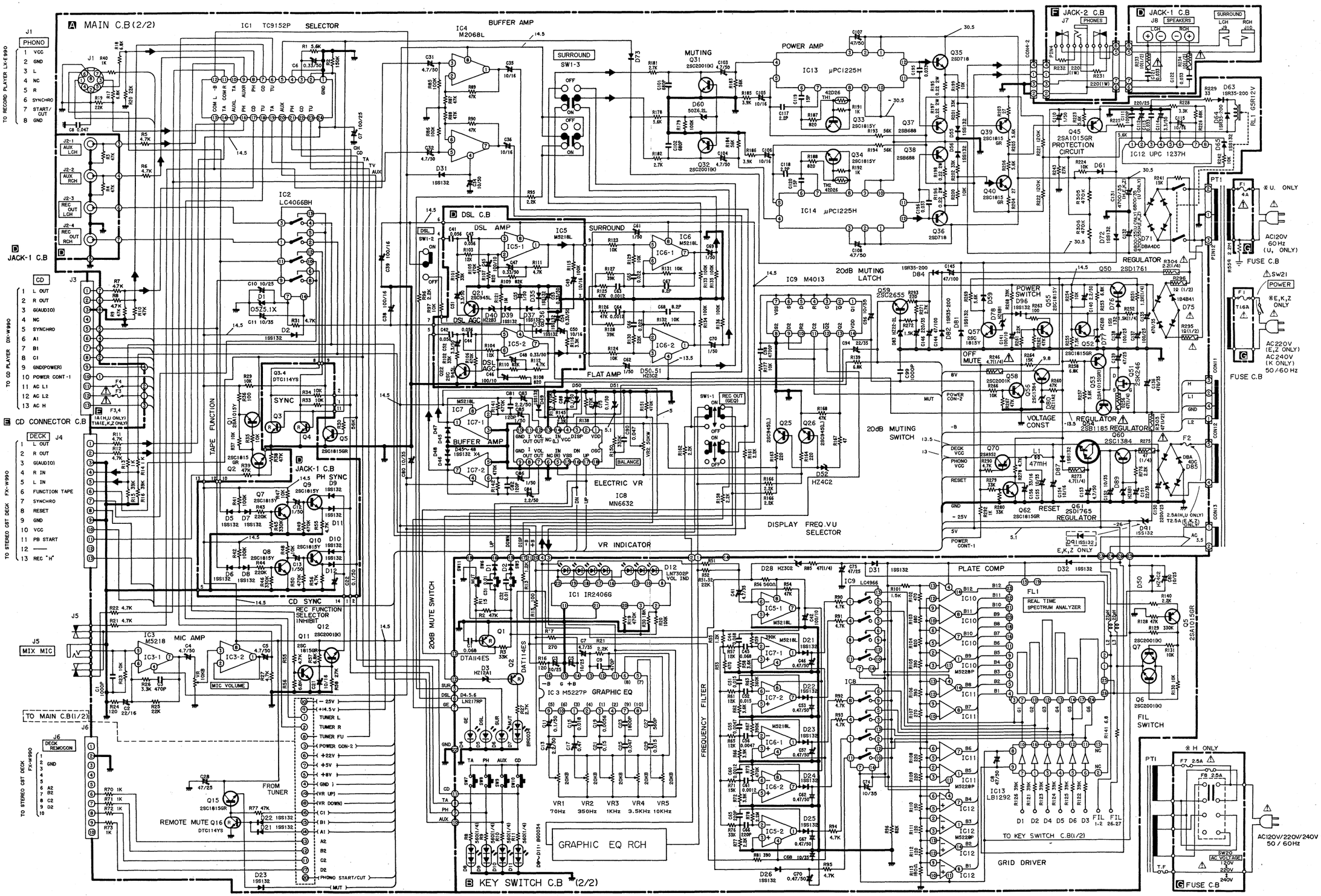
0→"L" 1→"H"(5V)


D JACK-I C.B
J2-1 DAT/AUX Lch
J2-2 DAT/AUX Rch
J2-3 REC OUT Lch
J2-4 REC OUT Rch
J10 SURROUND R ch
J9 SURROUND L ch
J8 SPEAKERS R ch L ch
To A MAIN C.B PIN 2
F JACK-2 C.B
To A MAIN C.B CON 4-1
J7 PHONES
SW 20 AC VOLTAGE 120V 220V 240V
G FUSE C.B (H ONLY)
PT
AC120V/220V/240V 50/60Hz
G FUSE C.B
R599 U ONLY
F1
PT1
CON11
To E CD CONECTOR C.B PIN 11
CON12
To A MAIN C.B PIN 12
CON13
To A MAIN C.B PIN 13
U ONLY
AC120V 60Hz
E,K,Z ONLY
SW21 POWER
AC 220V (E,Z ONLY) AC 240V (K ONLY) 50/60Hz
SW613 POWER
AM/FM PRESET STATION
SW607 MEMORY
SW617 M8
SW616 M7
SW615 M6
SW614 M5
SW621 M4
SW620 M3
SW619 M2
SW618 M1
TUNING / TIMER
TIMER
SW610 FM
SW609 △ UP
SW608 ▽ DOWN
SW611 AM (H,U ONLY) MW (E,K,Z ONLY)
SW612 LW
H,U, ONLY
E,K,Z ONLY
SW604 SET
SW601 SLEEP
SW603 TIMER STANDBY
SW605 EVERY
SW606 ONCE
SW602 TIME/ FREQUENCY
SW600 FM MODE STEREO ↔ MONO
B KEY SWITCH C.B
IC 300
FL 2
FL 1
REMOTE SENSOR C.B
CON 5
To A MAIN C.B PIN5
H REMOTE SENSOR C.B
PIN7
D303 REMOTE SENSOR
To B KEY SWITCH C.B
CON-4
CON-3
CON-2
CON-1
To A MAIN C.B PIN 1-4
To A MAIN C.B PIN 1-3
To A MAIN C.B PIN 1-2
To A MAIN C.B PIN 1-1
D6 SURROUND
D5 DSL
D4 REC OUT (G EQ)
D12 VOLUME INDICATOR
VOLUME
SW6 △ UP
SW5 ▽ DOWN
SW11 D7 MUTING
SW10 D11 CD
SW9 D10 DAT/AUX
SW8 D9 PHONO
SW7 D8 TAPE
FL 1 REAL TIME SPECTRUM ANALYZER
FL 2 DIGITAL SYNTHESIZER
VR5 10 KHz
VR4 3.5 KHz
VR3 1 KHz
VR2 350Hz
VR1 70Hz

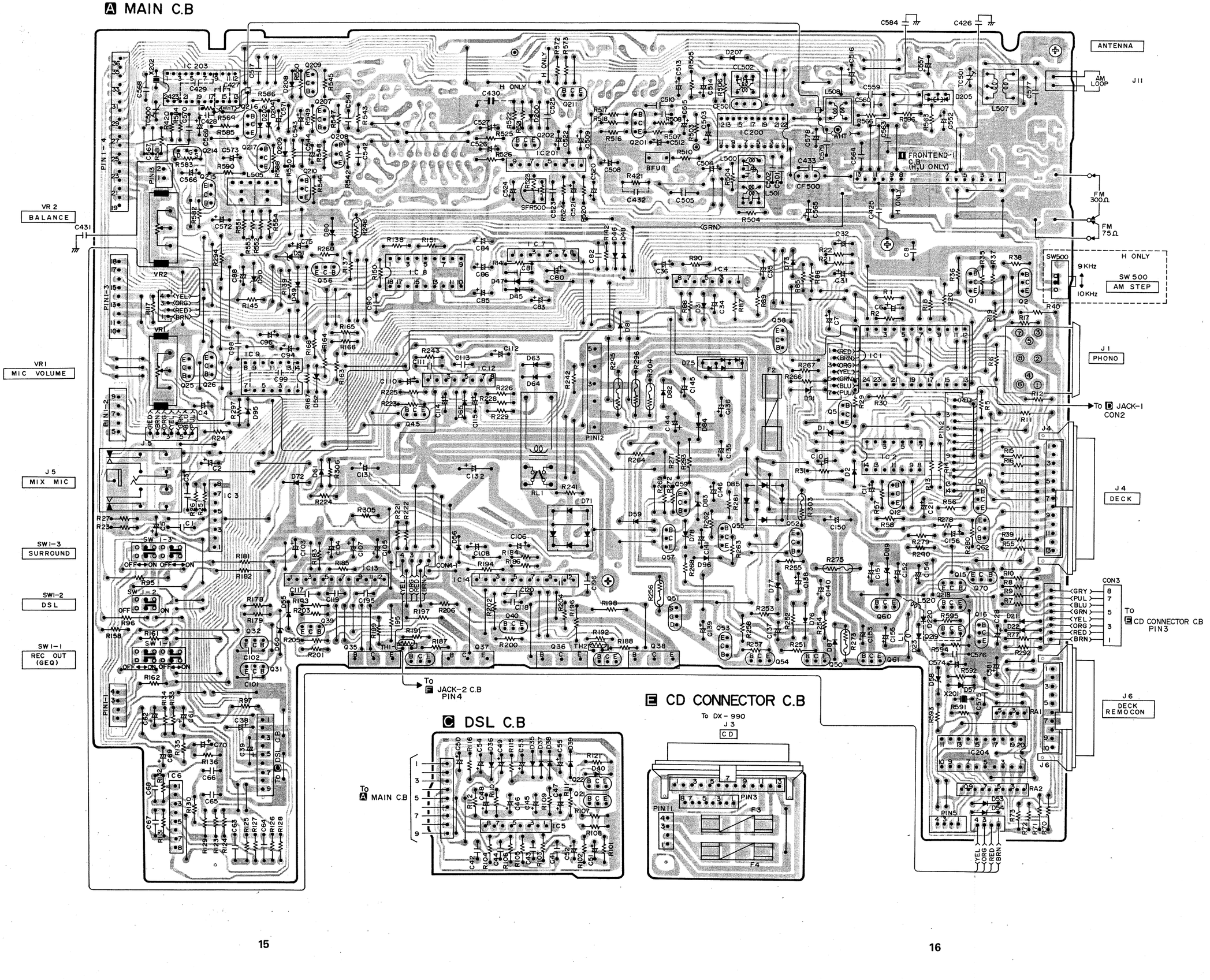
SCHEMATIC DIAGRAM-1 (RX-990)

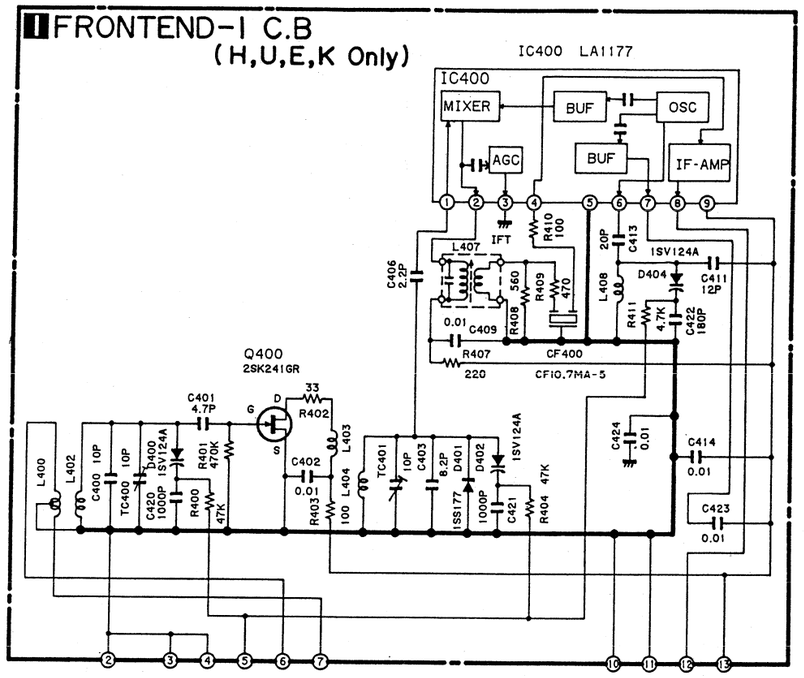


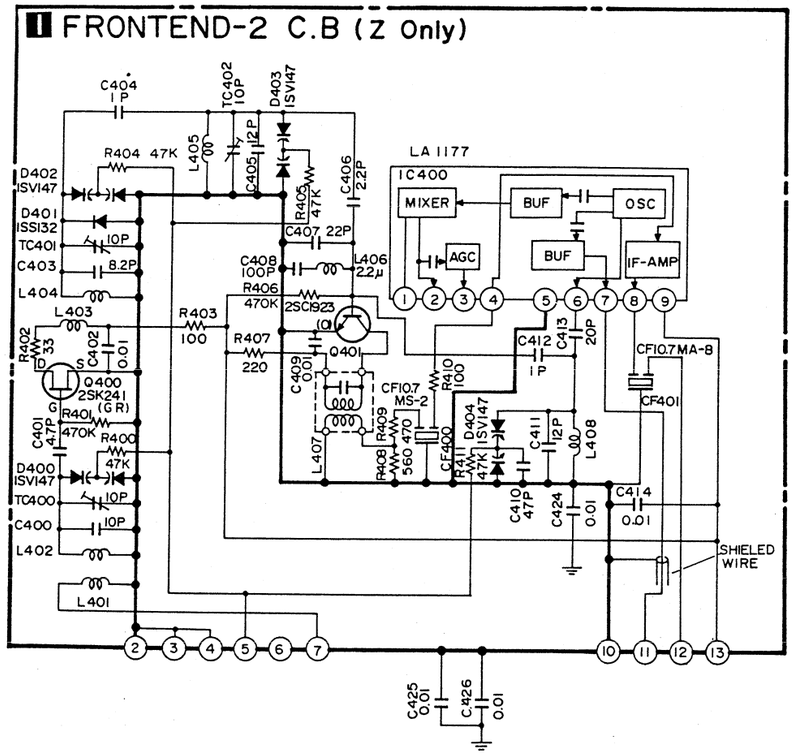
SCHEMATIC DIAGRAM-2 (RX-990)

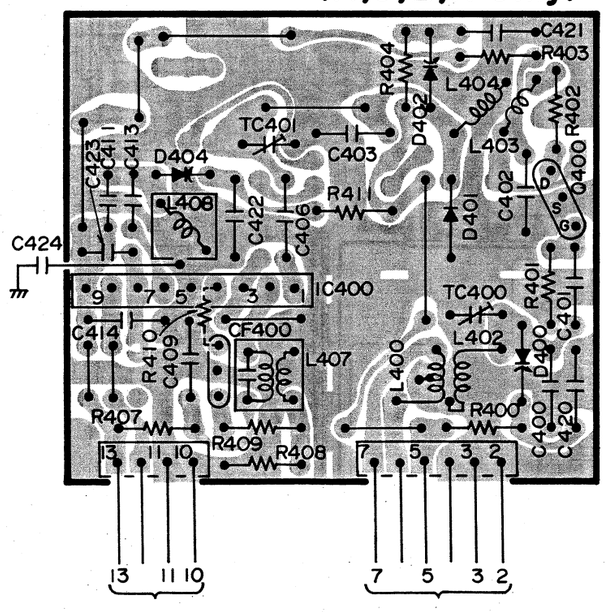


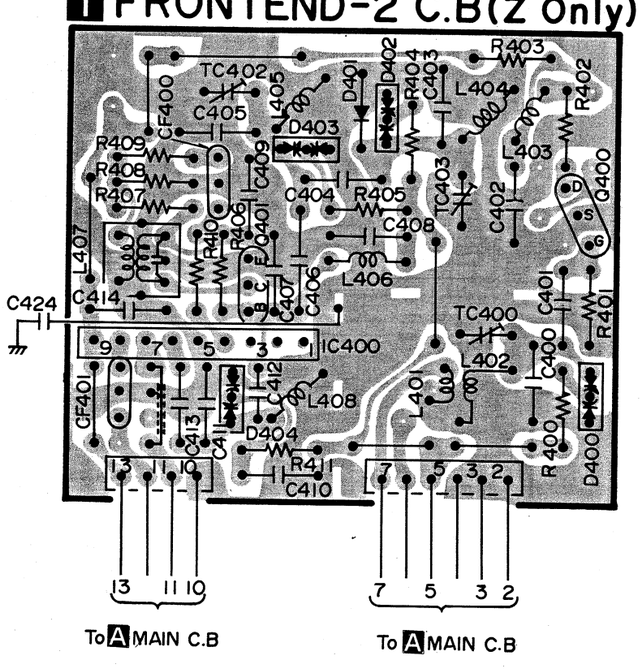
A MAIN C.B

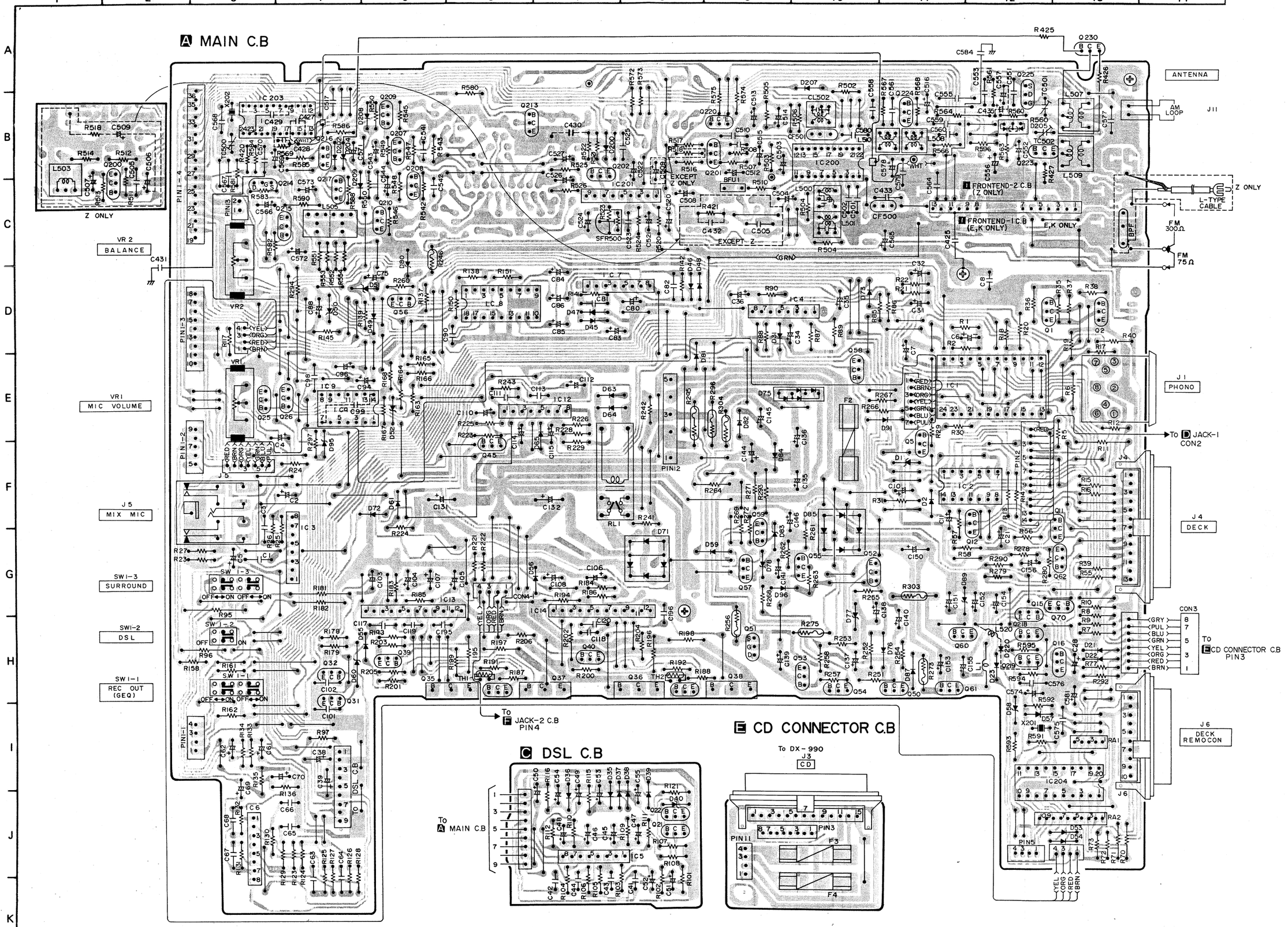

ANTENNA
AM LOOP J11
FM 300Ω
FM 75Ω
VR 2 BALANCE
VR1 MIC VOLUME
J5 MIX MIC
SW1-3 SURROUND
SW1-2 DSL
SW1-1 REC OUT (GEQ)
SW500 H ONLY 9KHz 10KHz SW 500 AM STEP
J1 PHONO
To D JACK-1 CON2
J4 DECK
CON3
To E CD CONNECTOR C.B PIN3
J6 DECK REMOCON
To F JACK-2 C.B PIN4
C DSL C.B
To A MAIN C.B
To DSL C.B
E CD CONNECTOR C.B
To DX-990 J3 CD
PIN11
PIN3
F3
F4
I FRONTEND-I C.B (H,U ONLY)
IC200
IC201
IC203
BFU1
CF500
SFR500
CL502
L500
L501
L502
L503
L504
L505
L506
L507
L508
L509
TC50
TC501
TC502
TC503
TC504
TC505
X201
RA1
RA2


FRONTEND-1 C.B
(H,U,E,K Only)
IC400 LA1177
IC400
MIXER
BUF
OSC
AGC
BUF
IF-AMP
IFT
L407
R410 100
R408 560
R409 470
C409 0.01
R407 220
CF400
CF10.7MA-5
C406 2.2P
20P
C413
L408
D404 1SV124A
C411 12P
R411 4.7K
C422 180P
Q400
2SK241GR
C401 4.7P
R402 33
C402 0.01
R403 100
L403
L404
TC401 10P
C403 8.2P
D401 1SS177
D402 1SV124A
1000P
C421
R404 47K
C424 0.01
C414 0.01
C423 0.01
L400
L402
C400 10P
TC400 10P
C420 1000P
D400 1SV124A
R401 470K
R400 47K


FRONTEND-2 C.B (Z Only)
C404 1P
TC402 10P
D403 1SV147
L405 0.01
C405 12P
R404 47K
C406 2.2P
R405 47K
C407 22P
D402 1SV147
D401 1SS132
TC401 10P
C403 8.2P
L404
L403
C408 100P
L406 22μ
R406 470K
2SC1923
Q401
R403 100
R407 220
R402 33
C402 0.01
Q400 2SK241 (GR)
C409 0.01
C401 47P
R401 470K
R400 47K
D400 1SV147
TC400 10P
C400 10P
L402
L401
LA1177
IC400
MIXER
BUF
OSC
AGC
BUF
IF-AMP
C412 1P
C413 20P
CF10.7MA-8
CF401
CF10.7 MS-2
R410 100
R409 560
R408 470
CF400
D404 1SV147
R411 47K
C411 12P
L407
L408
C410 47P
C424 0.01
C414 0.01
SHIELED WIRE
C425 0.01
C426 0.01


FRONTEND-1 C.B
(H,U,E,K Only)
C421
R404
R403
L404
TC401
C403
D402
C423
C411
C413
D404
L408
C422
C406
R411
D401
C402
Q400
C424
IC400
TC400
R401
C401
C414
CF400
L407
R410
C409
L400
L402
D400
R407
R400
C400
C420
R409
R408
13 11 10
7 5 3 2
To A MAIN C.B
To A MAIN C.B

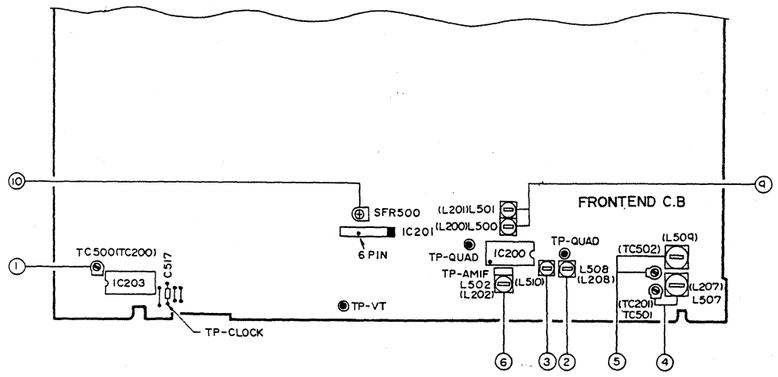

FRONTEND-2 C.B(Z Only)
R403
TC402
D402
R404
C403
R402
CF400
C405
L405
D401
D403
L404
R409
R408
R407
C409
Q400
C404
R405
C408
TC403
C402
L403
L407
C414
L406
C424
C406
C407
C401
R401
IC400
TC400
L402
C412
L408
CF401
C413
C411
L401
C400
D404
R400
R410
D400
C410
7 5 3 2
13 11 10
To A MAIN C.B
To A MAIN C.B


A MAIN C.B
Z ONLY
VR 2
BALANCE
VR1
MIC VOLUME
J5
MIX MIC
SW1-3
SURROUND
SW1-2
DSL
SW1-1
REC OUT
(GEQ)
ANTENNA
AM LOOP J11
Z ONLY
L-TYPE CABLE
FM 300Ω
FM 75Ω
J1
PHONO
To D JACK-1 CON2
J4
DECK
CON3
To E CD CONNECTOR C.B PIN3
J6
DECK REMOCON
F FRONTEND-2 C.B (Z ONLY)
I FRONTEND-I C.B (E,K ONLY)
E,K ONLY
EXCEPT Z ONLY
To F JACK-2 C.B PIN4
C DSL C.B
To A MAIN C.B
DSL C.B
E CD CONNECTOR C.B
To DX-990 J3 CD
F3
F4

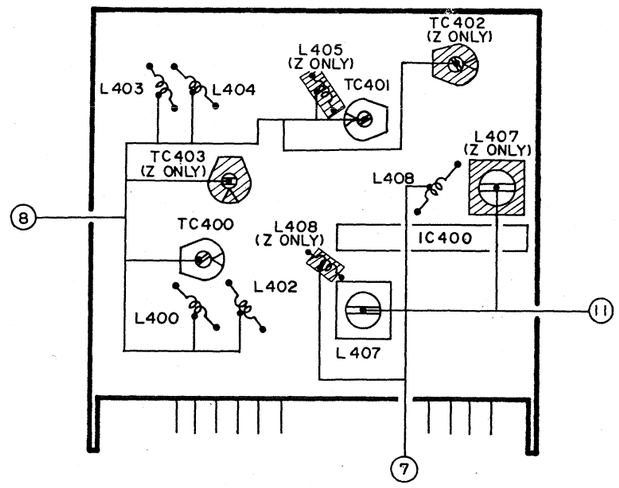
ADJUSTMENT (RX-990)

The circuit numbers in brackets ( ) are printed on the circuit boards.

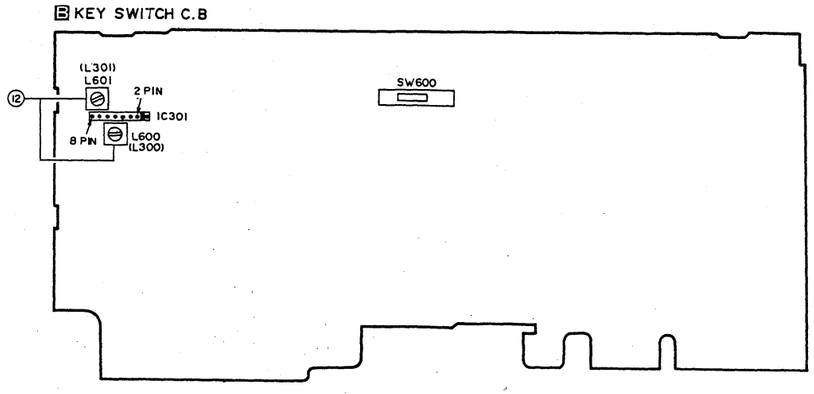
A MAIN C.B



FRONTEND C.B



B KEY SWITCH C.B



1. Clock Adjustment
Settings : • Test point : TP-CLOCK
• Adjustment location : TC500
Method : Set to AM 1611kHz (1610kHz, U, H MODEL) and adjust so that the test point becomes 2061kHz ± 10Hz (2060kHz ± 10Hz, U, H MODEL)

2. MW (AM) VT Adjustment
Settings : • Test point : TP-VT
• Adjustment location : L508
• DEV : AM 30%
• Modulation frequency : 1kHz
Method : Set to AM 522kHz (530kHz, U, H MODEL) and adjust so that the test point becomes 1.0 ± 0.05V.

3. LW VT Adjustment (E, K, Z MODEL)
Settings : • Test point : TP-VT
• Adjustment location : L510
• DEV : AM 30%
• Modulation frequency : 1kHz
Method : Set to AM 144kHz and adjust so that the test point becomes 1.5 ± 0.05V.

4. MW (AM) Tracking Adjustment
L507 ····· 603kHz (600kHz, U, H MODEL)
TC501 ····· 1404kHz (1400kHz, U, H MODEL)

5. LW Tracking Adjustment (E, K, Z MODEL)
L509 ····· 144kHz
TC502 ····· 290kHz

6. AM IF Adjustment
L502 ·· 603kHz (600kHz, U, H MODEL)

7. FM VT Adjustment
Settings : • Test point : TP-VT
• Adjustment location : L408
• DEV : TV MONO 25kHz
• Modulation frequency : 1kHz
Method : Set to FM 108MHz and adjust so that the test point becomes 18.0 ± 0.05V.

8. FM Tracking Adjustment
TC400, TC401 ····· 108.0MHz
TC402, 403 (Z ONLY)
L400, L402, L403, L404 ··· 87.5MHz
L401, L402, L403, L405 (Z ONLY)

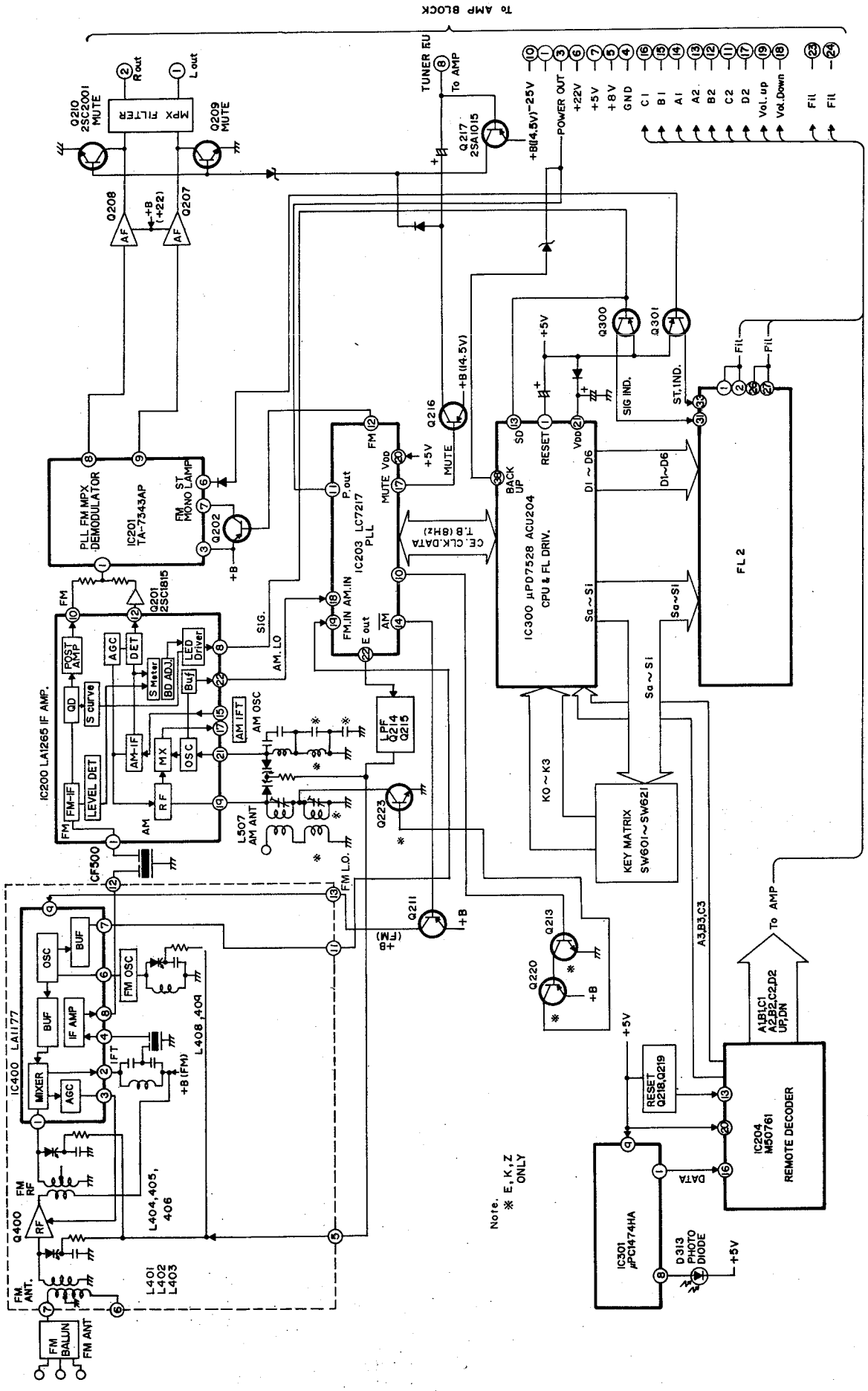
9. DC Balance/MONO Distortion Adjustment
Settings : • Test point TP-QUAD (DC balance)
REC OUT (Distortion)
• Adjustment location : L500 (DC balance)
L501 (Distortion)
• DEV : FM MONO 75kHz
• Modulation frequency : 1kHz
Method : Set to FM 98MHz and adjust L500 so that the output at TP-QUAD becomes 0 ± 0.02V. Next, adjust L501 so that the distortion becomes minimum (less than 0.3%). Adjust L500, L501 again so that both adjustments satisfy either standard.

10. MPX VCO Adjustment
Settings : • Test point : IC201 6-pin
• Adjustment location : SFR500
• FM MODE switch : STEREO
Method : Set to FM 98MHz and adjust so that the frequency at IC201 6-pin becomes 38kHz ± 50Hz.

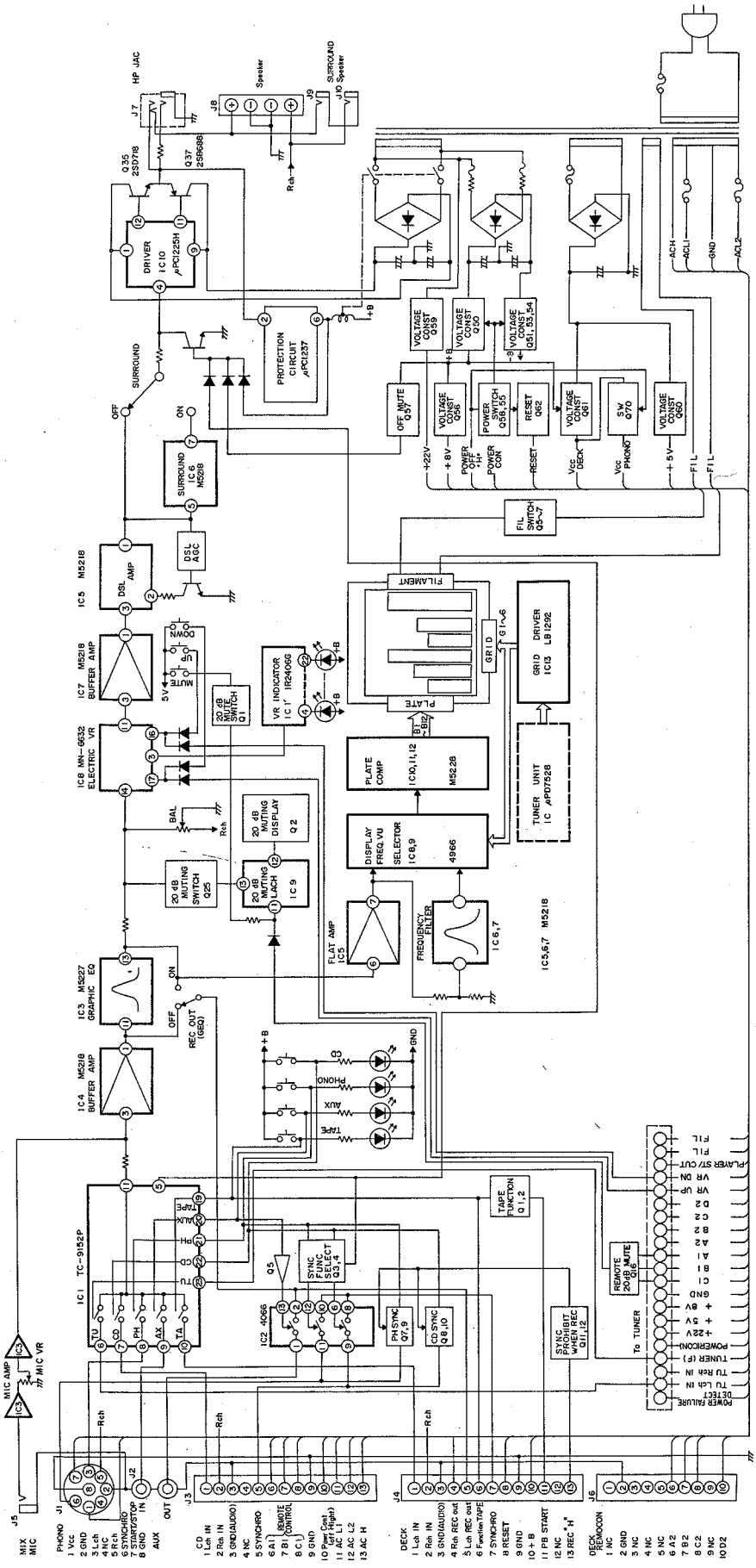
11. STEREO Distortion Adjustment
Settings : • Test point : REC OUT
• Adjustment location : L407
• FM MODE SW : STEREO
Method : Adjust so that the distortion becomes minimum (less than 0.6%).

12. Frequency Adjustment
Settings : • Test point : IC301 2-pin
• Adjustment location : L600, L601
• Input signal 38kHz −110dB
• Input point : IC301 8-pin
Method : Adjust so that the waveform becomes maximum.

BLOCK DIAGRAM-1 (RX-990)



BLOCK DIAGRAM-2 (RX-990)



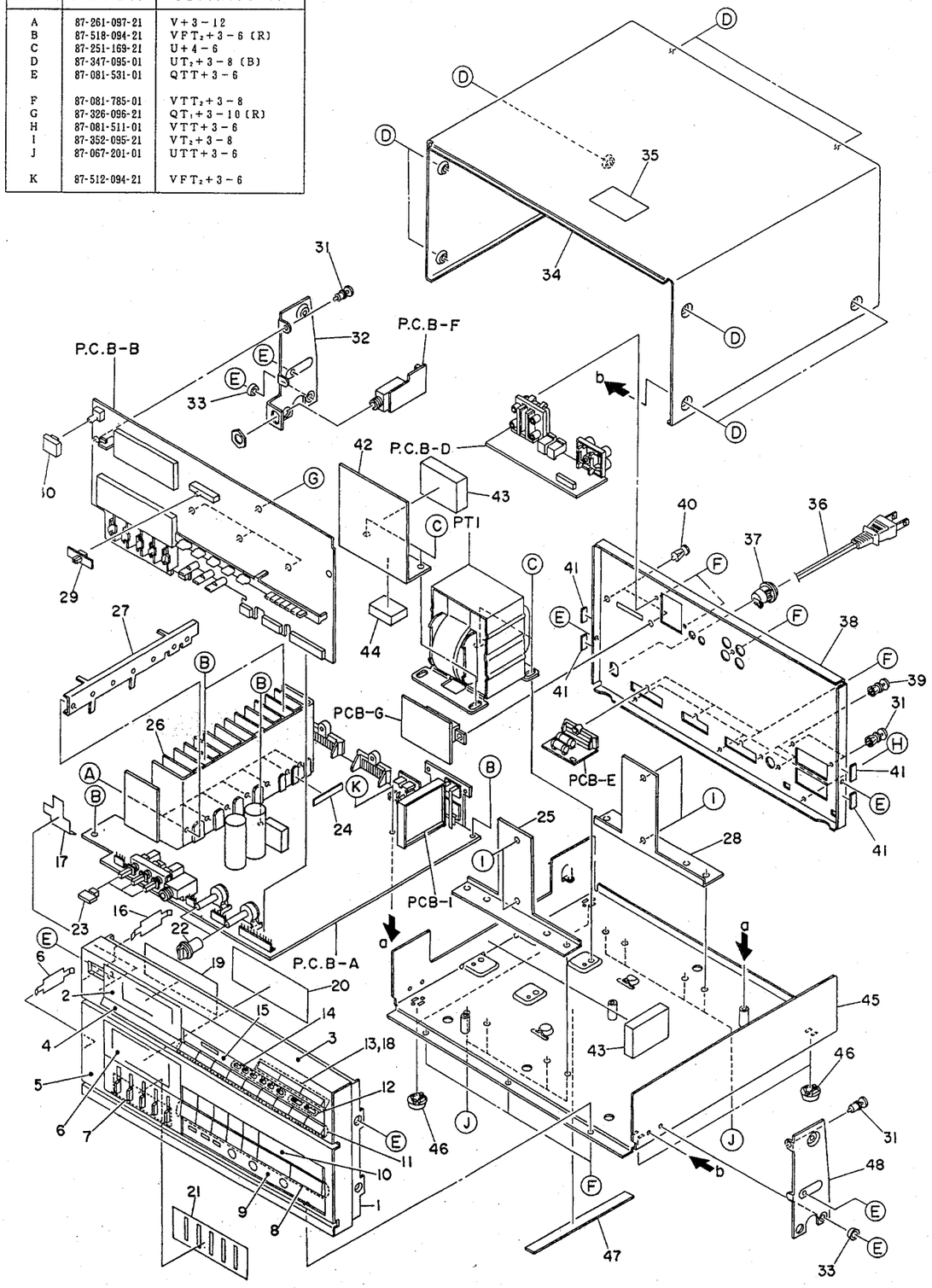
I C, μPD7528ACU-204
1 Terminal Description

Pin No.	Pin name	Discription
1	RESET	Reset input pin. Reset at High.
2 3	CL1 CL2	MPU clock input pin. (400kHz)
4 5	V_{PRE} V_{LOAD}	(−) Power supply for pre-driver. Connect to GND. (−) Power supply for drive LOAD.
6 7 8 9	K3 K2 K1 K0	Key matrix input pin.
10 | 12	——	N.C
13	SD	Aute stop input pin. Stop at Low.
14 15 16	A B C	Remote-control input pin.
17	——	N.C
18 19 20	CE DATA CLK	Communi cation line with LC7217.
21	V_{DD}	Power pin. 5V ± 10%.
22 23 24 25 26 27 28 29 30	Sa Sb Sc Sd Se Sf Sg Sh Si	Segment output for frequncy indication and time indication, and key matrix key-return signal source. Active High.
31 32 33 34 35 36	D3 D2 D1 D4 D5 D6	Frequncy indication/time indication digit signal output. Active Low.
37	——	——
38	B. K	Power failure detect input pin. Buck up Low.
39	$T_{\overline{INH}}$	Connected GND.
40	——	N.C.
41	T_{BASE}	Timer clock (8Hz) input pin.
42	V_{SS}	GND pin.

Pin No.	Pin name	Discription
1 24	X IN X OUT	Crystal oscilator input.
2 3 4	CE DATA CLK	Communication line with μPD7528ACU-204.
5 | 8		N.C
9	T. BASE	Timer indication clock 8 Hz.
10	$\overline{\text{MW/LW}}$ L	Output High level durring LW.
11	POW CONT	Power control output pin. High level at Power ON.
12	$\overline{\text{FM}}$ L	Output High level durring FM.
13	VHF L	N. C
14	$\overline{\text{AM}}$ L	Output High level durring MW.
15 16	—	N.C
17	MUTE	Outputs "L" momentarily when a key is operated. This goes "L" when power is turned off. (Active "L")
18	AM IN	AM local osc input pin.
19	FM IN	FM local osc input pin.
20	V_{DD}	Power pin. 5 V ± 10%
21	E_o	N.C
22	E_o	PLL error output pin.
23	Vss	GND pin.

EXPLODED VIEW (RX-990)

Ref. No.	PART NO.	DESCRIPTION
A	87-261-097-21	V+3-12
B	87-518-094-21	VFT2+3-6 (R)
C	87-251-169-21	U+4-6
D	87-347-095-01	UT2+3-8 (B)
E	87-081-531-01	QTT+3-6
F	87-081-785-01	VTT2+3-8
G	87-326-056-21	QT1+3-10 (R)
H	87-081-511-01	VTT+3-6
I	87-352-095-21	VT2+3-8
J	87-067-201-01	UTT+3-6
K	87-512-094-21	VFT2+3-6



MECHANICAL PARTS LIST (RX-990)

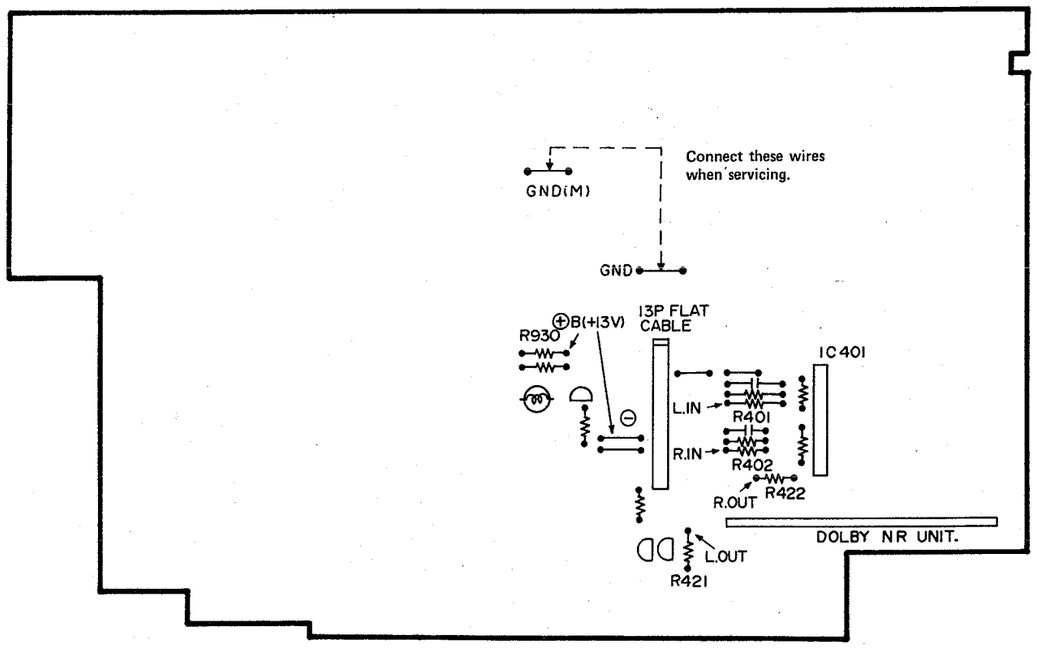
※ Please order the all parts for this model to Japan.

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1	★81-783-002-110	CABINET,FRONT		1
	2	★81-783-009-010	WINDOW,A FL		1
	3	★81-783-032-010	PANEL A,FRONT EX(H,U ONLY)		1
	3	★81-783-003-010	PANEL A,FRONT(E,K,Z ONLY)		1
	4	★81-783-018-010	PUSH-KEY,DUMMY		1
	5	★81-783-033-010	PANEL B,FRONT EX		1
	6	★81-783-010-010	WINDOW B,FL		1
	7	★81-788-003-010	KNOB,GE		5
	8	★81-783-013-110	PUSH-KEY,VR(H,U ONLY)		1
	8	★81-783-042-010	PUSH-KEY,VR EX(E,K,Z ONLY)		1
	9	★81-783-006-010	WINDOW,DSL		1
	10	★81-783-007-110	WINDOW,VR		1
	11	★81-783-017-010	PUSH-KEY,MEMORY		1
	12	★81-783-015-010	PUSH-KEY,UP-DOWN		1
	13	★81-779-005-010	PUSH-KEY,BAND2(H,U ONLY)		1
	14	★81-783-014-010	PUSH-KEY,TIMER		1
	15	★81-783-034-010	WINDOW,TIMER EX(H,U ONLY)		1
	15	★81-783-038-010	WINDOW,TIMER EX3(E,K,Z ONLY)		1
	16	★81-714-203-210	P-SPRING,A		2
	17	★81-783-623-010	SHIELD		1
	18	★81-779-004-010	PUSH-KEY,BAND 1(E,K,Z ONLY)		1
	19	★81-783-023-010	SHEET,FL S		1
	20	★81-783-022-010	SHEET,FL		1
	21	★81-783-024-010	PLATE,GE		1
	22	★84-424-008-010	KNOB,VOLUME		2
	23	81-783-017-010	PUSH-BUTTON,TIMER		3
	24	★81-783-225-010	PLATE,TR		1
	25	★81-783-239-010	HOLDER F		1
	26	---	HEAT SINK ASSY EX		1
	27	★81-783-204-010	HOLDER,TR		1
	28	★81-783-240-010	HOLDER B		1
	29	★81-783-016-110	KNOB,SLIDE		1
	30	81-777-008-010	PUSH-BUTTON,POWER		1
	31	★87-085-102-010	NYLON RIVET 3.5-5.5	H,U,E,K:4 Z:12	
	32	---	HOLDER,SIDE L		1
	33	★84-700-300-010	G CUSHION		2
	34	★81-783-020-110	CABINET,STEEL		1
	35	---	LABEL,TEMP		1
	36	★87-034-732-010	AC CORD(H ONLY)		1
	36	★87-034-731-010	AC CORD(U ONLY)		1
	36	★87-034-736-010	AC CORD(E,Z ONLY)		1
	36	★87-034-734-010	AC CORD(K ONLY)		1
	37	★87-085-184-010	CORD BUSHING(H ONLY)		1
	37	★87-085-189-010	CORD BUSHING(U ONLY)		1
	37	★87-085-185-010	CORD BUSHING(E,K,Z ONLY)		1
	38	---	PANEL,REAR		1
	39	★87-085-090-010	NYLON RiVET		2
	40	★87-084-063-010	NYLON RIVET 3-5.5(H ONLY)		2
	41	---	G CUSHION,8-15-2.5		4
	42	★81-783-635-010	SHIELD TRANSFORMER		1
	43	★81-783-228-010	G CUSHION,35X25X7		2
	44	★82-749-211-010	SPACE CUSHION U		1
	45	---	AMP.CHASSIS ASSY EX		1
	46	★87-055-057-010	FOOT B		4
	47	---	SHEET,IC		1
	48	---	HOLDER,SIDE R		1

FX-W990

NOTICE WHEN SERVISING

A MAIN C.B



SERVICE POWER SUPPLY

FX-SW990 has no power supply itself by A. C. mains.
When servicing, use RX-990 or connect the regulated D.C power supply as shown above.

DISASSMBLY INSTRUCTIONS

1. Removing Bottom cabinet.

1) Remove the 3 hooks. (See Figure-1)
2) When mount the Bottom cabinet, restore the hooks by finger.

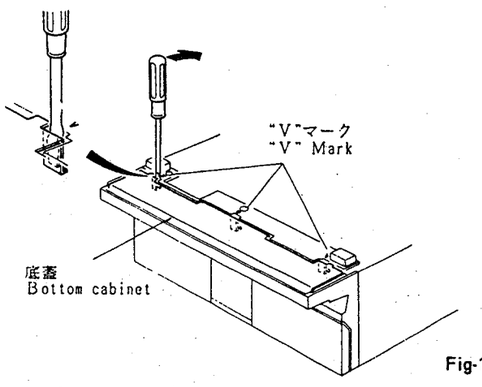


Fig-1

ELECTRICAL MAIN PARTS LIST (FX-W990)

※ Please order the all parts for this model to Japan.

REF. No.		PART No.	DESCRIPTION
=== IC ===			
		87-020-454	IC,DM6851
		87-020-261	IC,LA6358S
		81-785-620	IC,LC6520C-3290
		87-020-096	IC,M4066BP
		87-020-533	IC,M4069UBP
		87-020-679	IC,M4572BP
		87-027-952	IC,M51544AL
		87-027-895	IC,M5218L
		87-020-758	IC,NJM2068SD
=== TRANSISTOR ===			
		89-503-735	FET,2SK373GR
		87-026-269	TRANSISTOR,DTA114ES
		89-109-521	TRANSISTOR,2SA952K
		89-110-155	TRANSISTOR,2SA1015GR
		89-318-155	TRANSISTOR,2SC1815GR
		89-320-011	TRANSISTOR,2SC2001K
		89-328-785	TRANSISTOR,2SC2878AB
		89-411-110	TRANSISTOR,2SD1111
		89-414-683	TRANSISTOR,2SD1468S
=== MAIN CIRCUIT BOARD SECTION ===			
		89-030-113	DOLBY UNIT
PCB-A		*	MAIN CIRCUIT BOARD
C101	★	87-018-035	CAP,CERA-SOL S 180P
C102	★	87-018-035	CAP,CERA-SOL S 180P
C105	★	87-018-134	CAP,CERA-SOL SS 0.01
C106	★	87-018-134	CAP,CERA-SOL SS 0.01
C109	★	87-010-134	CAP,ELECT BP 4.7-35
C110	★	87-010-134	CAP,ELECT BP 4.7-35
C111	★	87-018-034	CAP,CERA-SOL S 150P
C112	★	87-018-034	CAP,CERA-SOL S 150P
C201	★	87-018-039	CAP,CERA-SOL S 390P
C202	★	87-018-039	CAP,CERA-SOL S 390P
C207	★	87-010-134	CAP,ELECT BP 4.7-35
C208	★	87-010-134	CAP,ELECT BP 4.7-35
C209	★	87-010-402	CAP,ELECT 2.2-50SME
C210	★	87-010-101	CAP,ELECT 220-16SME
C211	★	87-018-034	CAP,CERA-SOL S 150P
C212	★	87-018-034	CAP,CERA-SOL S 150P
C301	★	87-010-134	CAP,ELECT BP 4.7-35
C302	★	87-010-134	CAP,ELECT BP 4.7-35
C305	★	87-018-044	CAP,CERA-SOL S 1000P
C306	★	87-018-044	CAP,CERA-SOL S 1000P
C321	★	87-018-044	CAP,CERA-SOL S 1000P
C322	★	87-010-392	CAP,ELECT 33-35SME
C323	★	87-018-034	CAP,CERA-SOL S 150P
C324	★	87-018-034	CAP,CERA-SOL S 150P
C325	★	87-014-069	CAP,PP 3300P(100V)
C330	★	87-010-392	CAP,ELECT 33-35SME
C331	★	87-010-392	CAP,ELECT 33-35SME
C333	★	87-018-036	CAP,CERA-SOL S 220P
C334	★	87-018-036	CAP,CERA-SOL S 220P
C401	★	87-010-080	CAP,ELECT 100-16
C402	★	87-010-263	CAP,ELECT 100-10V
C403	★	87-010-248	CAP,ELECT 220-10SME
C405	★	87-018-044	CAP,CERA-SOL S 1000P
C406	★	87-018-044	CAP,CERA-SOL S 1000P
C407	★	87-010-379	CAP,ELECT 22-16SME
C408	★	87-010-379	CAP,ELECT 22-16SME
C410	★	87-010-379	CAP,ELECT 22-16SME
C411	★	87-010-404	CAP,ELECT 4.7-50SME
C412	★	87-010-404	CAP,ELECT 4.7-50SME
C501	★	87-010-371	CAP,ELECT 470-6.3
C502	★	87-010-401	CAP,ELECT 1-50SME
C503	★	87-018-034	CAP,CERA-SOL S 150P
C504	★	87-018-045	CAP,CERA-SOL 2200P
C505	★	87-018-046	CAP,CERA-SOL S 0.0047
C506	★	87-010-401	CAP,ELECT 1-50SME
C507	★	87-018-034	CAP,CERA-SOL S 150P
C508	★	87-018-045	CAP,CERA-SOL 2200P
C509	★	87-018-046	CAP,CERA-SOL S 0.0047
C510	★	87-018-034	CAP,CERA-SOL S 150P
C511	★	87-018-034	CAP,CERA-SOL S 150P
C601	★	87-018-043	CAP,CERA-SOL S 820P
C602	★	87-018-043	CAP,CERA-SOL S 820P
C603	★	87-018-042	CAP,CERA-SOL S 680P
C604	★	87-018-042	CAP,CERA-SOL S 680P
C606	★	87-010-379	CAP,ELECT 22-16SME
C607	★	87-010-404	CAP,ELECT 4.7-50SME
C608	★	87-010-404	CAP,ELECT 4.7-50SME
C639	★	87-010-101	CAP,ELECT 220-16SME
C701	★	87-010-237	CAP,ELECT 1000-16(SR)
C702	★	87-010-381	CAP,ELECT 330-16SME
C703	★	87-010-237	CAP,ELECT 1000-16(SR)
C704	★	87-010-237	CAP,ELECT 1000-16
C801	★	87-010-248	CAP,ELECT 220-10SME
C802	★	87-010-379	CAP,ELECT 22-16SME
C803	★	87-018-047	CAP,CERA-SOL S 0.01Y-16
C804	★	87-018-046	CAP,CERA-SOL S 0.0047
C805	★	87-010-401	CAP,ELECT 1-50SME
C806	★	87-010-379	CAP,ELECT 22-16SME
C807	★	87-010-402	CAP,ELECT 2.2-50SME
C808	★	87-010-381	CAP,ELECT 330-16SME
C809	★	87-010-381	CAP,ELECT 330-16SME
C810	★	87-010-379	CAP,ELECT 22-16SME
C811	★	87-010-402	CAP,ELECT 2.2-50SME
C812	★	87-010-381	CAP,ELECT 330-16SME
C813	★	87-010-381	CAP,ELECT 330-16SME
D1		87-020-110	DIODE 1SS177
D2		87-020-110	DIODE 1SS177
D3		87-020-110	DIODE 1SS177
D4		87-020-110	DIODE 1SS177
D5		87-027-286	DIODE,ZENER HZ-5C1
D6		87-020-110	DIODE 1SS177
D7		87-020-110	DIODE 1SS177
D8		87-020-110	DIODE 1SS177
D9		87-020-110	DIODE 1SS177
D10		87-020-110	DIODE 1SS177
D11		87-020-110	DIODE 1SS177
D12		87-020-110	DIODE 1SS177
D13		87-020-110	DIODE 1SS177
D14		87-020-110	DIODE 1SS177
D15		87-020-110	DIODE 1SS177
D16		87-020-110	DIODE 1SS177
D17		87-020-110	DIODE 1SS177
D18		87-020-110	DIODE 1SS177
D19		87-020-123	DIODE DS446
D20		87-020-123	DIODE DS446
D21		87-020-123	DIODE DS446
D22		87-020-123	DIODE DS446
D23		87-027-556	DIODE,ZENER HZ11B3
D301		87-020-110	DIODE 1SS177
D302		87-020-123	DIODE DS446
D303		87-020-110	DIODE 1SS177
D304		87-020-110	DIODE 1SS177

※ *Please order the all parts for this model to Japan.*

REF. No.		PART No.	DESCRIPTION
D305		87-020-110	DIODE 1SS177
D405		87-027-286	DIODE,ZENER HZ-5C1
D406		87-027-286	DIODE,ZENER HZ-5C1
D501		87-020-110	DIODE 1SS177
D502		87-020-110	DIODE 1SS177
D503		87-027-286	DIODE,ZENER HZ-5C1
D702		87-027-332	DIODE,ZENER HZ6B1L
J1		82-205-631	13P CORD (REMOCON-1)
J2		82-205-632	10P CORD (REMOCON-2)
L301	★	82-125-603	COIL,TRAP 105K
L302	★	82-125-603	COIL,TRAP 105K
L303	★	87-003-128	COIL,5.6MMHJ
L304	★	87-003-128	COIL,5.6MMHJ
L305	★	87-003-125	COIL,3.3MMHJ
L306	★	87-003-125	COIL,3.3MMHJ
L307	★	81-785-619	COIL,OSC,BIAS 105K
L701	★	81-760-621	COIL 130UH
L801	★	81-785-618	COIL,OSC-LC6520C
R880	★	87-025-406	RES,MFO 1W68F
R884	★	87-025-406	RES,MFO 1W68F
R888	★	87-025-406	RES,MFO 1W68F
R892	★	87-025-406	RES,MFO 1W68F
SFR101	★	87-021-738	SFR 1K
SFR102	★	87-021-738	SFR 1K
SFR103	★	87-021-737	SFR 470
SFR104	★	87-021-737	SFR 470
SFR201	★	87-021-738	SFR 1K
SFR202	★	87-021-738	SFR 1K
SFR203	★	87-021-737	SFR 470
SFR204	★	87-021-737	SFR 470
SFR301	★	87-021-738	SFR 1K
SFR302	★	87-021-738	SFR 1K
SFR341	★	87-021-739	SFR 47K
SFR342	★	87-021-739	SFR 47K

=== FRONT CIRCUIT BOARD SECTION ===

PCB-B	*	FRONT CIRCUIT BOARD
D1	87-020-110	DIODE 1SS177
D2	87-020-110	DIODE 1SS177
D3	87-020-110	DIODE 1SS177
D4	87-020-110	DIODE 1SS177
D5	87-020-110	DIODE 1SS177
D6	87-020-110	DIODE 1SS177
D7	87-020-110	DIODE 1SS177
D8	87-020-110	DIODE 1SS177
D9	87-020-110	DIODE 1SS177
D10	87-020-110	DIODE 1SS177
D11	87-020-110	DIODE 1SS177
D12	87-020-110	DIODE 1SS177
D13	87-020-110	DIODE 1SS177
D14	87-020-110	DIODE 1SS177
D15	87-020-110	DIODE 1SS177

D16	★	87-020-848	LED,SLP177B (SYNC.DUB 1▶2 HI-S)
D17	★	87-020-848	LED,SLP177B (SYNC.DUB 1▶2 NOR-S)
D18	★	87-020-848	LED,SLP477B (D2 PAUSE)
D19	★	87-020-848	LED,SLP177B (D2 REC MUTE)
D20	★	87-020-848	LED,SLP177B (D2 RECORD)
D21	★	87-020-849	LED,SLP277B (D2 REV PLAY)
D22	★	87-020-849	LED,SLP277B (D2 PLAY)
D23	★	87-020-849	LED,SLP277B (D1 REV PLAY)
D24	★	87-020-849	LED,SLP277B (D1 PLAY)
D25		87-020-110	DIODE 1SS177
D27		87-020-110	DIODE 1SS177
D28		87-020-110	DIODE 1SS177

S5		87-031-893	TACT SW (D1 STOP)
S6		87-031-893	TACT SW (SYNC.DUB 1 2 HI-S)
S7		87-031-893	TACT SW (SYNC.DUB 1 2 NOR-S)
S8		87-031-893	TACT SW (D1 MS◀◀)
S9		87-031-893	TACT SW (D1 MS▶▶)
S10		87-031-893	TACT SW (D1 REV PLAY)
S11		87-031-893	TACT SW (D1 PLAY)
S12		87-031-893	TACT SW (D2 STOP)
S13		87-031-893	TACT SW (D2 PAUSE)
S14		87-031-893	TACT SW (D2 REC MUTE)
S15		87-031-893	TACT SW (D2 RECORD)
S16		87-031-893	TACT SW (D2 MS◀◀)
S17		87-031-893	TACT SW (D2 MS▶▶)
S18		87-031-893	TACT SW (D2 REV PLAY)
S19		87-031-893	TACT SW (D2 PLAY)
S20		87-036-032	SLIDE SW (DOLBY B-C NR)
S21		87-036-033	SLIDE SW (CBRS)
S22		87-036-033	SLIDE SW (BLANK SKIP)
S23		87-036-032	SLIDE SW (TIMER)
S24		87-036-032	SLIDE SW (REVERSE MODE)

=== DISPLAY CIRCUIT BOARD SECTION ===

PCB-C	*	DISPLAY CIRCUIT BOARD
D801	87-020-691	DIODE 1SS132
D802	87-020-691	DIODE 1SS132
D803	87-020-691	DIODE 1SS132
D810	★ 87-020-399	LED LN350GPH (D1 DIRECTION)
D811	★ 87-020-399	LED LN350GPH (D2 DIRECTION)
D812	★ 87-020-399	LED LN350GPH (D2 DIRECTION)
D813	★ 87-020-399	LED LN350GPH (D2 DIRECTION)
D814	★ 87-020-613	LED LN317GPH (D1 NOR)
D815	★ 87-020-612	LED LN217RPH (D1 CO/METAL)
D816	★ 87-020-613	LED LN317GPH (D2 NOR)
D817	★ 87-020-614	LED LN417YPH (D2 CO)
D818	★ 87-020-612	LED LN217RPH (D2 METAL)
D819	★ 87-020-613	LED LN317GPH (DOLBY B-C NR,B)
D820	★ 87-020-612	LED LN217RPH (DOLBY B-C NR,C)

=== MECHANISM-1 CIRCUIT BOARD SECTIO ===

PCB-D	*	MECHANISM-1 CIRCUIT BOARD
S1001	87-036-040	PUSH SW D2A2110-3 (CO,D1)
S1002	87-036-039	PUSH SW D2A2120-4 (CST,D1)
S1003	87-036-039	PUSH SW D2A2120-4 (DIR,D1)
SFR1	87-021-966	SFR 4.7K (D1)
SFR2	87-021-966	SFR 4.7K (D1)
SOL1	86-535-611	SOLENOID X-3 PL (D1)
SOL2	86-535-612	SOLENOID X-3 FR (D1)

=== MECHANISM-2 CIRCUIT BOARD SECTIO ===

PCB-E	*	MECHANISM-2 CIRCUIT BOARD
S1004	87-036-039	PUSH SW D2A2120-4 (MT,D2)
S1005	87-036-040	PUSH SW D2A2110-3 (CO,D2)
S1006	87-036-039	PUSH SW D2A2120-4 (CST,D2)
S1007	87-036-039	PUSH SW D2A2120-4 (DIR,D2)
S1008	87-036-039	PUSH SW D2A2120-4 (RE-B,D2)
S1009	87-036-039	PUSH SW D2A2120-4 (RE-A,D2)
SFR3	87-021-966	SFR 4.7K (D2)
SFR4	87-021-966	SFR 4.7K (D2)
SOL3	86-535-611	SOLENOID X-3 PB (D2)
SOL4	86-535-612	SOLENOID X-3 FR (D2)

=== SENSOR-1 CIRCUIT BOARD SECTION ===

CP1001	87-020-755	PHOTO SENSOR SPI-900-0102(W/PCB-F)

※ *Please order the all parts for this model to Japan.*

REF. No.		PART No.	DESCRIPTION
CP1002		87-020-755	PHOTO SENSOR SPI-900-0102(W/PCB-G)

=== MISCELLANEOUS ===

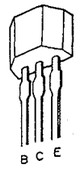
CON1		81-785-629	CONNECTOR ASSY 6P (PBH)
CON2		86-535-605	CONNECTOR ASSY RPEH 9P
LED51	★	87-027-944	LED,SLF301C (D1 CASSETTE)
LED52	★	87-020-965	LED,SLF-101C (D2 CASSETTE)
M1001		87-045-235	MOTOR MMA6B2LW (D1)
M1002		87-045-235	MOTOR MMA6B2LW (D2)
PH		87-046-265	HEAD PH (D1)
RPEH		87-046-275	HEAD RPEH HADKH 5503A (D2)

Combination circuit board A 81-785-601
PCB-A 81-785-602
PCB-B 81-785-603
PCB-C 81-785-605

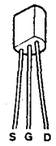
Combination circuit board B 86-535-601
PCB-D, E 86-535-602
PCB-F, G 86-535-603

RX-990
FX-W990

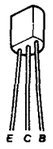
2SA952
2SA1015
2SC945
2SC1815
2SC2001
2SD1111



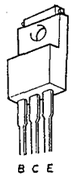
DTA114
DTC114



2SK246
2SK373



2SD1468



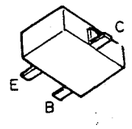
2SB688
2SB1185
2SD718
2SD1761
2SD1765

PRACTICAL SERVICE FIGURE (FX-W990)

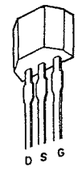
<DECK Section>

Playback output : (TTA-161)	300 ± 3.0mV (LINE OUT, 400Hz)
PB/REC output : (TTA-119K)	210 ± 30mV (LINE OUT, 1kHz)
PB/REC distortion :	Less than 2.5% (CrO_2 taps) Less than 2.0% (MT, NORM. taps)
Playback noise :	Less than 1.5mV (DOLBY C NR ON, with CrO_2, NORM. taps) Less than 2.5mV (DOLBY B NR OFF, with NORM. tapes)
Erase ratio (125Hz) :	More than 57dB
Crosstalk :	More than 55dB (1kHz, 0VU)
Channel separation :	More than 30dB (1kHz, 0VU)
PB/REC S/N retio :	More than 40/43dB (CrO_2), 44dB (MT)
(WTD-A)	(DOLBY C NR OFF/ON with MT, CrO_2 taps) More than 38/42dB (DOLBY C OFF/ON with NORM. taps)
Recording bias frequency :	105kHz
Tape speed : (TTA-111S)	3kHz ± 1.5%
Wow & flutter : (W. R. M. S)	Less than 0.07% (FWD.) (DECK1,2) Less than 0.075% (REV.)
Tape-up torque :	30~60g-cm (DECK1,2)
Fast forward torque :	120 ± 30g-cm (DECK 1,2)
Rewind torque :	120 ± 30g-cm (DECK 1,2)
Back-tension :	3 ± 2g-cm (DECK 1,2)
Pinch roller pressure :	290 ± 70g (DECK 1,2)
Test taps :	METAL TTA-119MP CrO_2 TTA-119H NORMAL TTA-119K

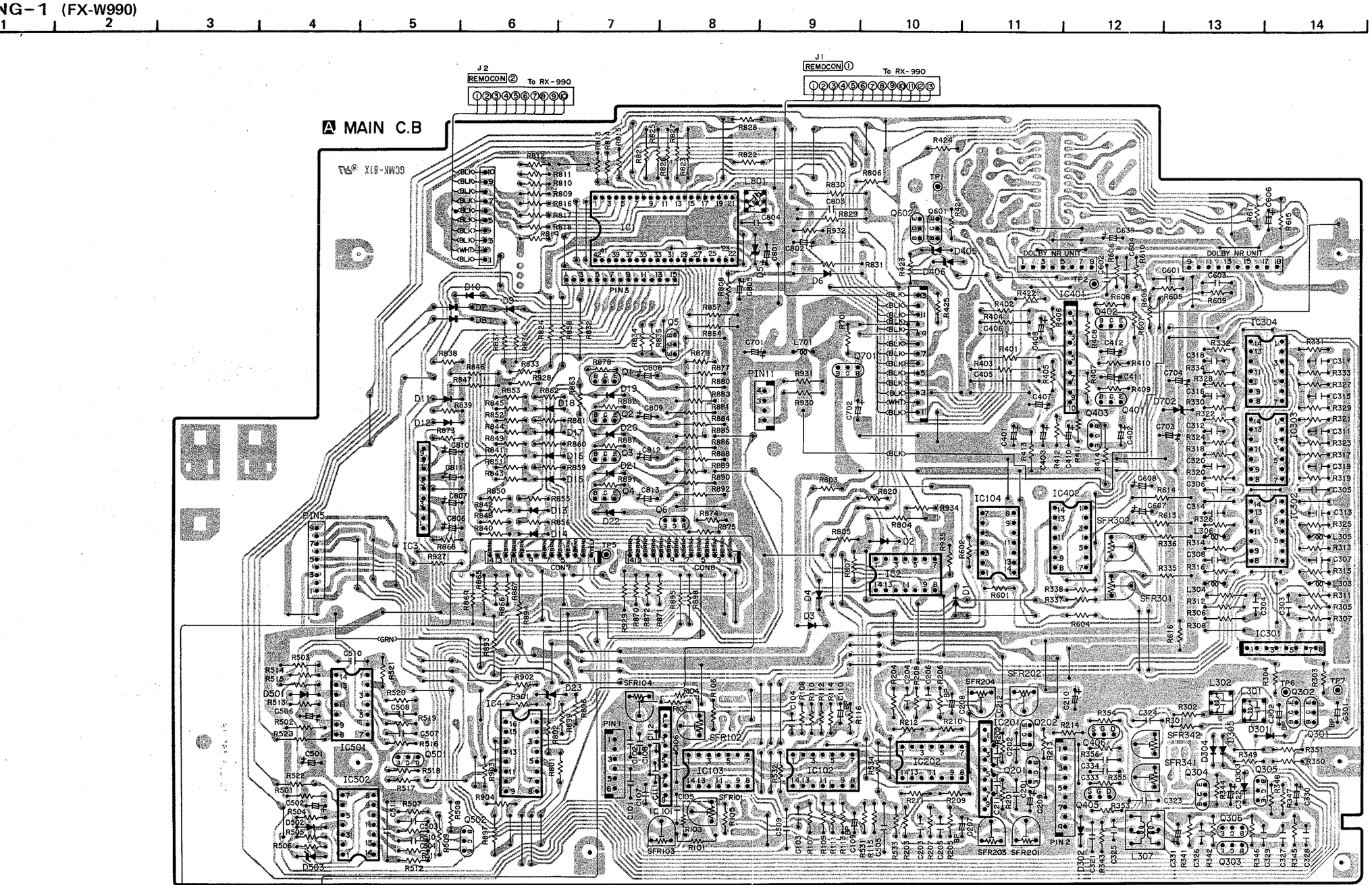
2SC2655



2SC2759



2SK161
2SK241


A MAIN C.B
J2
REMOCON ②
To RX-990
J1
REMOCON ①
To RX-990
DOLBY NR UNIT
DOLBY NR UNIT
PIN3
PIN11
PIN5
PIN1
PIN2
CON7
CON8
IC1
IC3
IC4
IC101
IC102
IC103
IC104
IC201
IC202
IC301
IC302
IC303
IC304
IC401
IC402
IC501
IC502
IC62
SFR101
SFR102
SFR104
SFR106
SFR201
SFR202
SFR203
SFR204
SFR301
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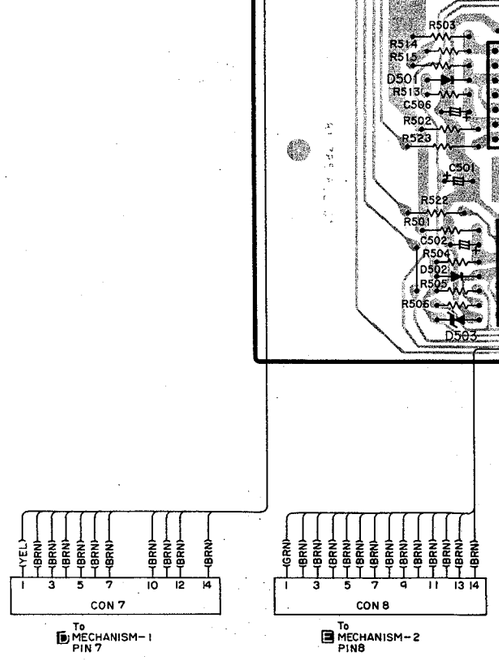
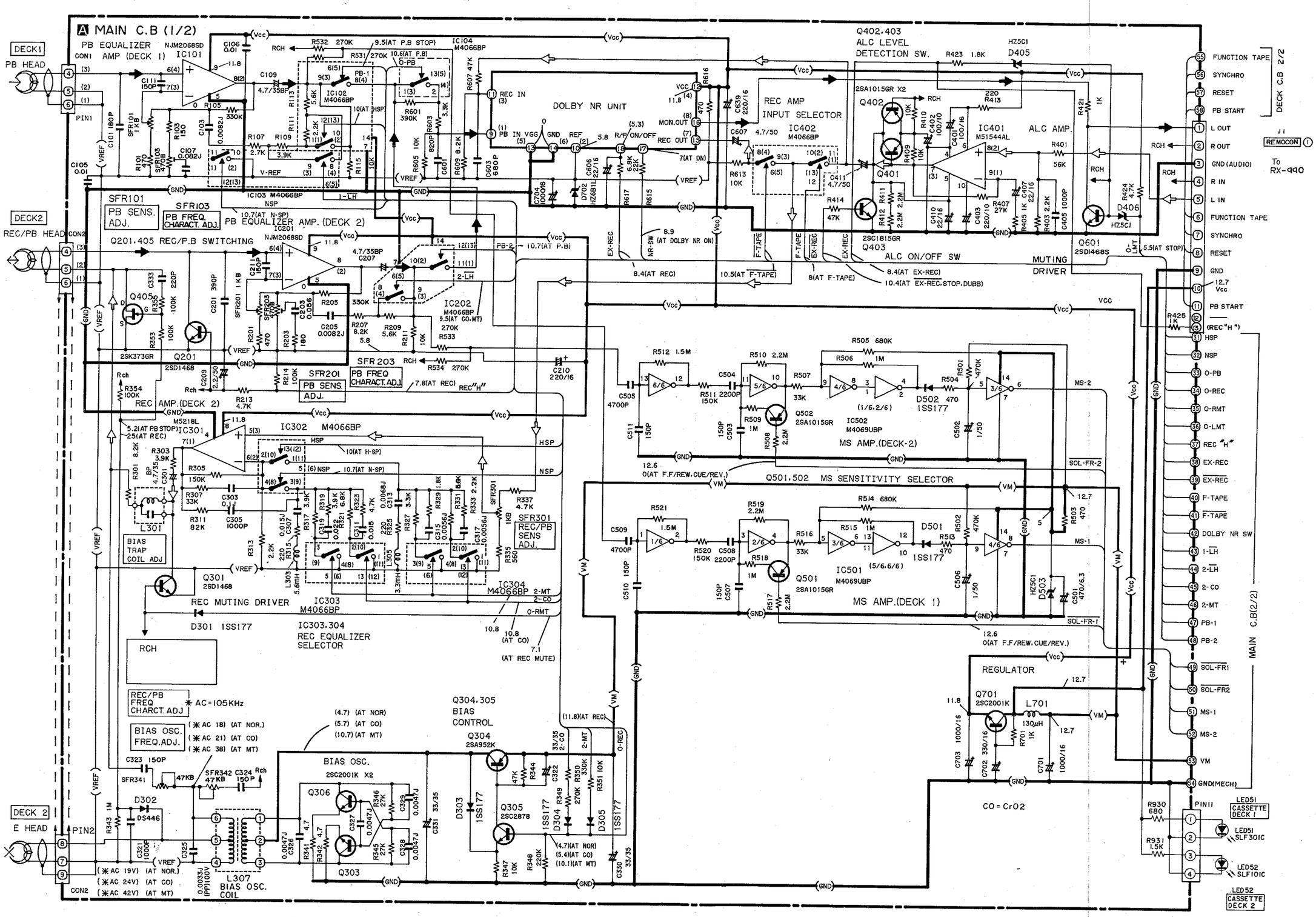
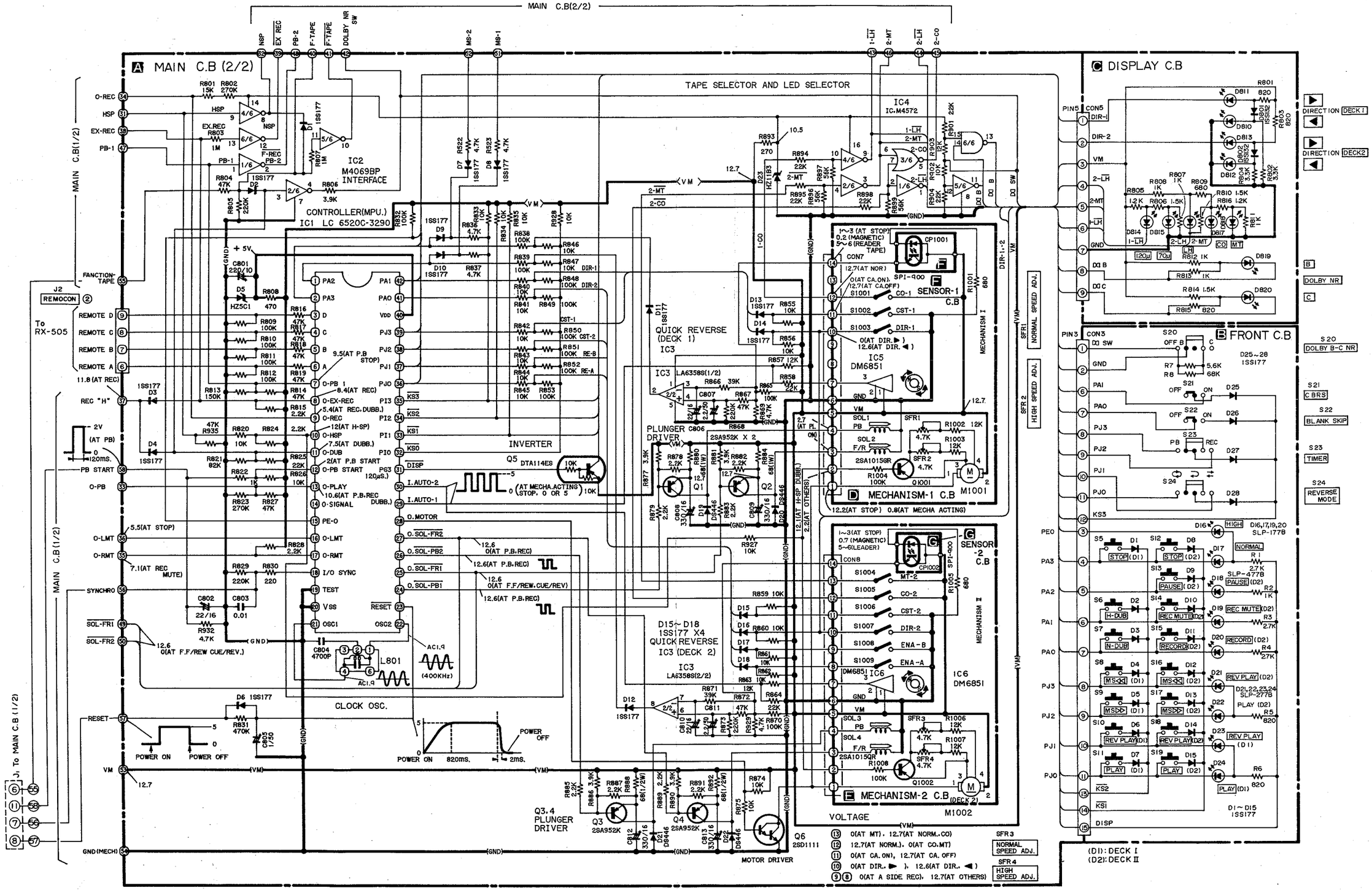
TP7
L301
L302
L304
L306
L307
L701


CON 7
To
MECHANISM-1
PIN 7
CON 8
To
MECHANISM-2
PIN8

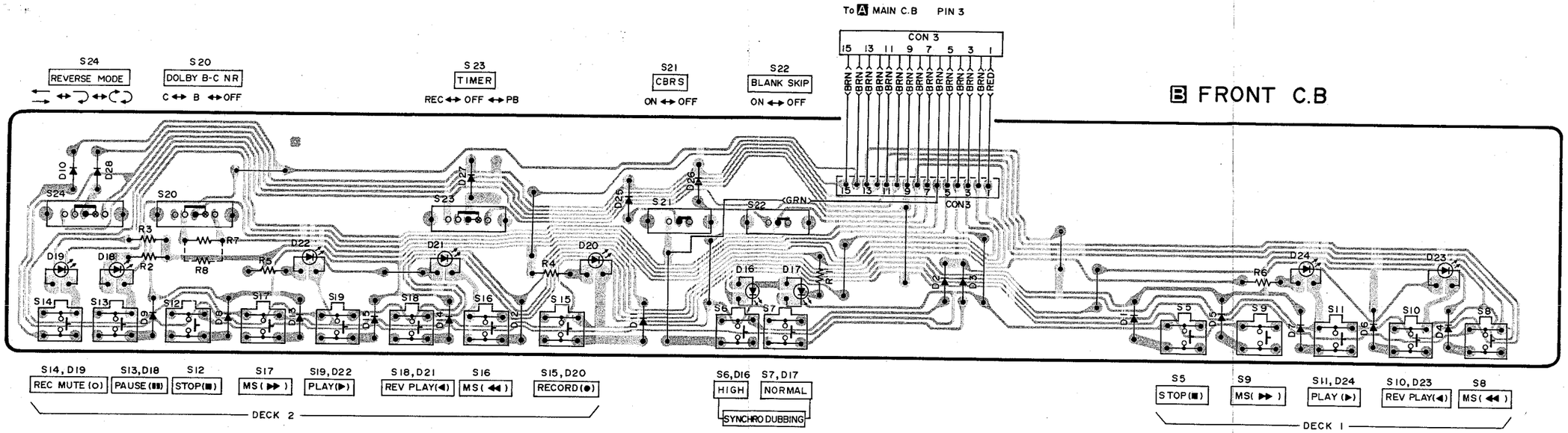
SCHEMATIC DIAGRAM-1 (FX-W990)

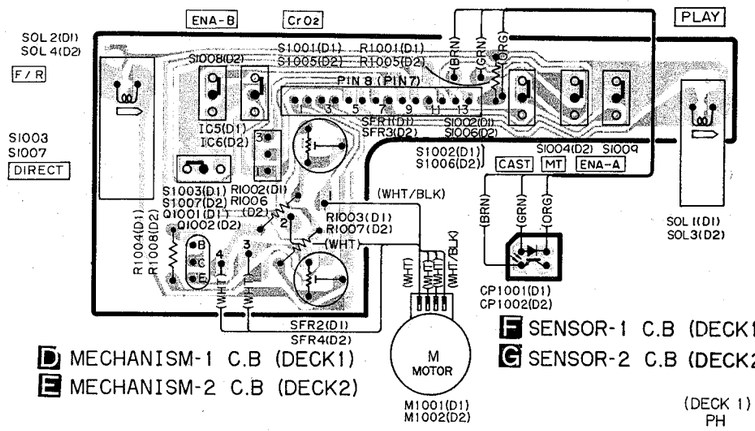


SCHEMATIC DIAGRAM-2 (FX-W990)



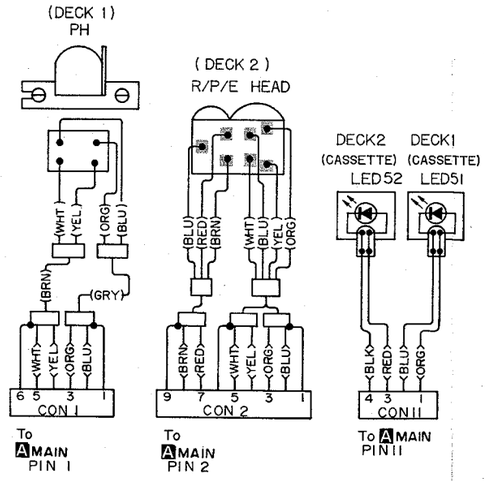
B FRONT C.B



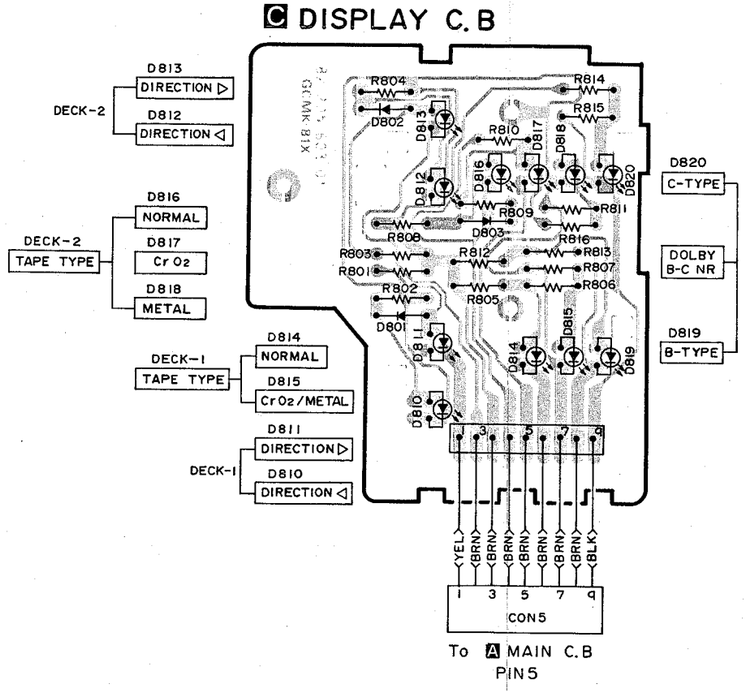


D MECHANISM-1 C.B (DECK1)
E MECHANISM-2 C.B (DECK2)

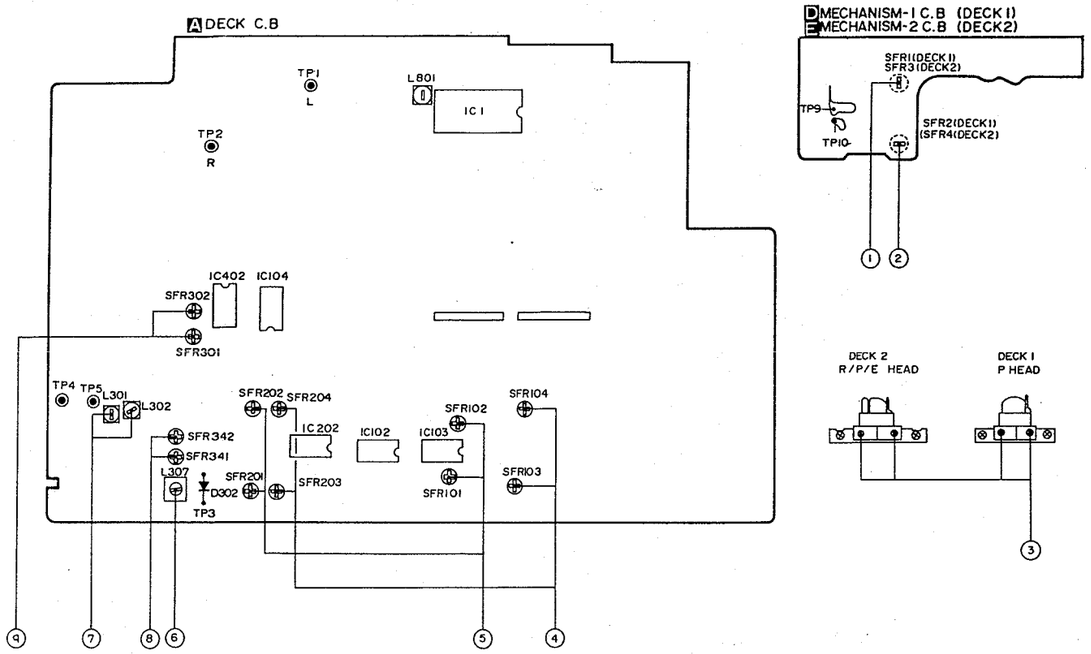
F SENSOR-1 C.B (DECK1)
G SENSOR-2 C.B (DECK2)



C DISPLAY C.B



ADJUSTMENT (FX-W990)



1. Normal Speed Adjustment (DECK-1, DECK-2)
Settings : • Test tape : TTA-111S
• Test point : REC OUT
• Adjustment location : SFR1 (DECK-1)
SFR3 (DECK-2)
Method : Play back the test tape, adjust for 3000Hz

2. High Speed Adjustment (DECK-1, DECK-2)
Settings : • Test tape : TTA-111H
• Test point : REC OUT
• Adjustment location : SFR2 (DECK-1)
SFR4 (DECK-2)
Method : Play back the test tape, and make the high speed condition to be applied DC 13V at TP5. Adjust for 3000Hz.
Note : When the adjustment is stopped, take off DC 13V at TP5 and stop it.

3. Head Azimuth Adjustment (DECK-1, DECK-2)
Settings : • Test tape : TTA-317H
• Test point : REC OUT
• Adjustment location : Head azimuth adjustment screw
Method : Play back the 10 kHz signal of the test tape, and adjust so that the output becomes maximum.
Note : Perform on each PLAY and REV PLAY mode.

4. PB Frequency Response Adjustment (DECK-1, DECK-2)
Settings : • Test tape : TTA-317H
• Test point : TP1 (Lch)
RP2 (Rch)
• Dolby NR switch : OFF
• Adjustment location : SFR103 (DECK-1, Lch)
SFR104 (DECK-1, Rch)
SFR203 (DECK-2, Lch)
SFR204 (DECK-2, Rch)
Method : Play back the test tape, and adjust so that the output becomes 4dB ± 0.2dB

5. PB Sensitivity Adjustment (DECK-1, DECK-2)
Settings : • Test tape : TTA-161
• Test point : TP1 (Lch)
TP2 (Rch)
Dolby NR switch : OFF
Adjustment location : SFR101 (DECK-1, Lch)
SFR102 (DECK-1, Rch)
SFR201 (DECK-2, Lch)
SFR202 (DECK-2, Rch)
Method : Play back the test tape, and adjust so that the output becomes 300 mV ± 10m V.

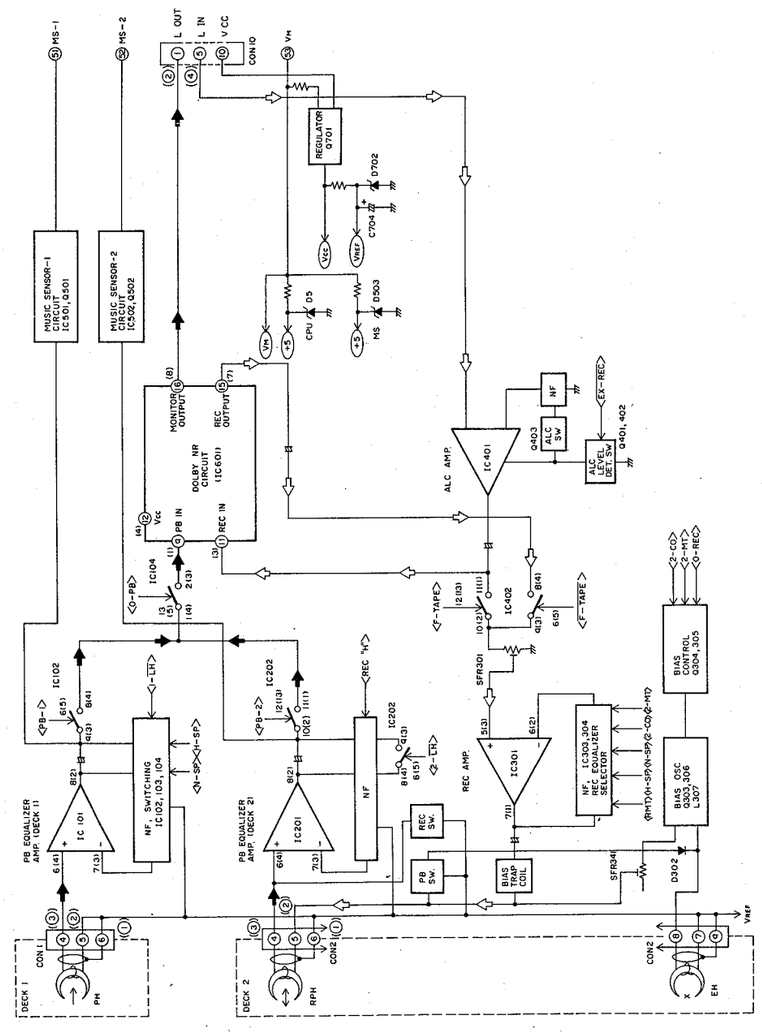
6. REC OSC Frequency Adjustment (DECK 2)
Settings : • Test tape : TTA-119MP
• Test point TP3
• Adjustment location : L307
Method : Adjust so that the output frequency becomes 105.5kHz ± 0.5kHz.

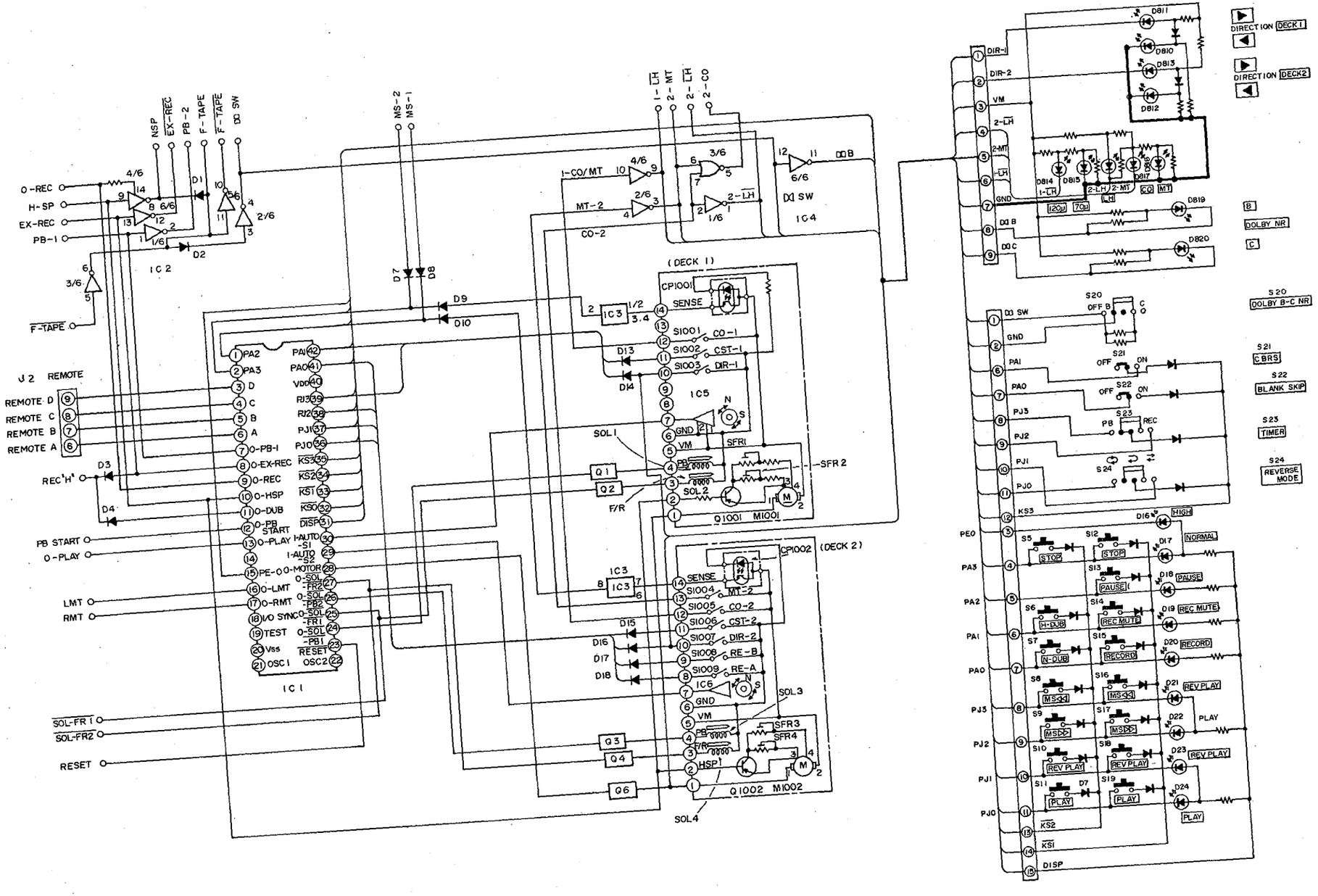
7. Bias OSC Trap Coil Adjustment (DECK 2)
Settings : • Test tape : TTA-119MP
• Test point : TP4 (Lch)
TP5 (Rch)
• Adjustment location : L301 (Lch)
L302 (Rch)
Method : Play back the test tape, and adjust for minimum output

8. REC/PB Frequency Response Adjustment (DECK-2)
Settings : • Test tape : TTA-119K
• Test point : REC OUT
• Dolby NR switch : OFF
• Adjustment location : SFR341 (Lch)
SFR342 (Rch)
Method : Set the DECK-2 in the REC mode and adjust ATT so that the 1kHz signal output is 20 mV at TP1(TP2). Record the 1kHz and 10kHz signals, then play back the recorded tape and adjust so that the output difference between 1kHz and 10kHz becomes + 1.0 dB ± 0.2 dB.

9. REC/PB Sensitivity Adjustment (DECK-2)
Settings : • Test tape : TTA-119K
• Test point : REC OUT
• Dolby NR switch : OFF
• Adjustment location : SFR301 (Lch)
SFR302 (Rch)
Method : Set the DECK-2 in the REC mode and adjust ATT so that the 1 kHz signal output is 20 mV at TP1(TP2). Record the 1kHz signal, then play back the recorded tape, and adjust so that the output becomes 20 mV ± 0.2dB.

BLOCK DIAGRAM-3 (FX-W990)




O-REC
H-SP
EX-REC
PB-1
NSP
EX-REC
PB-2
F-TAPE
F-TAPE
DD SW
IC2
D1
D2
F-TAPE
J2 REMOTE
REMOTE D
REMOTE C
REMOTE B
REMOTE A
REC'H'
D3
D4
PB START
O-PLAY
LMT
RMT
SOL-FR1
SOL-FR2
RESET
IC1
MS-2
MS-1
D7
D8
D9
D10
1-LH
2-MT
2-LH
2-CO
1-CO/MT
MT-2
CO-2
DD SW
IC4
(DECK 1)
CP1001
SENSE
SI001 CO-1
SI002 CST-1
SI003 DIR-1
IC5
SOL 1
SOL 2
SFR1
SFR2
Q1001 M1001
Q1
Q2
F/R
D13
D14
IC3
(DECK 2)
CP1002
SI004 MT-2
SI005 CO-2
SI006 CST-2
SI007 DIR-2
SI008 RE-B
SI009 RE-A
IC6
SOL 3
SFR3
SFR4
HSP1
Q1002 M1002
SOL 4
Q3
Q4
Q6
D15
D16
D17
D18
DIRECTION DECK1
DIRECTION DECK2
DOLBY NR
DOLBY B-C NR
CBRS
BLANK SKIP
TIMER
REVERSE MODE
STOP
PAUSE
H-DUB
REC MUTE
N-DUB
RECORD
REV PLAY
PLAY
HIGH
NORMAL

IC. LC6520C-3290

1 Terminal Description

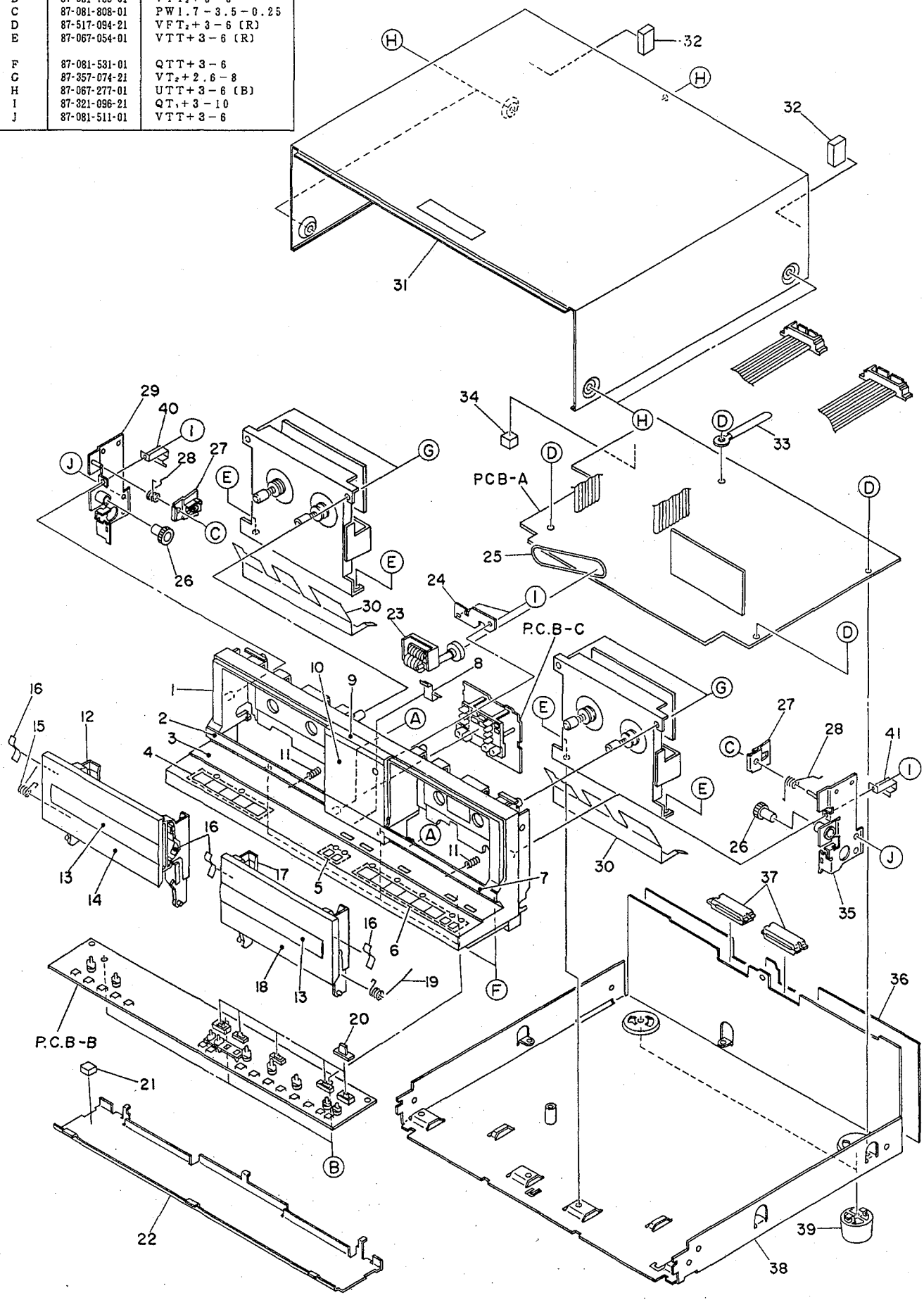
<table>
<tr><th>Pin No.</th><th>Pin name</th><th>Description</th></tr>
<tr><td>7</td><td>O-PB1</td><td>Outputs "H" when DECK 1 is in the play or stop mode.</td></tr>
<tr><td>8</td><td>O-EX-REC</td><td>Outputs "H" during recording.</td></tr>
<tr><td>9</td><td>O-REC</td><td>Outputs "H" during recording or dubbing to switch bias on and off.</td></tr>
<tr><td>10</td><td>O-HSP</td><td>Outputs "H" in the PLAY/REC PLAY state during high-speed dubbing.</td></tr>
<tr><td>11</td><td>O-DUB</td><td>Outputs "H" during dubbing. Dubbing output terminal.</td></tr>
<tr><td>12</td><td>O-PB START</td><td>Outputs "H" for 120 msec when starting play to switch the function of the amplifier (for TAPE FUNCTION).</td></tr>
<tr><td>13</td><td>O-PLAY</td><td>Outputs "H" during PLAY (REC).
Outputs "L" during STOP,PAUSE,CUR/REVIEW, ▷▷/◁◁</td></tr>
<tr><td>14</td><td>——</td><td>Not used.</td></tr>
<tr><td>16</td><td>O-LMT</td><td>Line mute output. "L" output releases muting.
• Line mute logic (marked ○ shows releasing of muting)
<table>
<tr><th>CUE/REVIEW</th><th>STOP</th><th>PAUSE</th><th>PLAY PAUSE</th><th>PLAY</th><th>REC PLAY</th><th>REC PLAY PAUSE</th></tr>
<tr><td>○</td><td></td><td></td><td></td><td>○</td><td>○</td><td>○</td></tr>
</table></td></tr>
<tr><td>17</td><td>O-RMT</td><td>Recording amplifier muting output. "L" output releases muting.</td></tr>
<tr><td>18</td><td>I/O SYNC</td><td>Synchronous recording input/output and CBRS pin.
When the REC OUT switch of the amplifier is set to CD, this pin goes "H" when REC is pressed. When REC is pressed at "H", pause is entered and this pin outputs "L". When this pin goes "L" (CD is started), in this state,pause is released. When the REC OUT switch is set to other than CD, this pin goes "L", when REC is pressed. When REC is pressed at "L", recording starts. When CBRS switch is turned on during recording, this pin outputs "L" in quick reverse. (However, this is only when the input is "L"). When REC is pressed during recording pause while at "H", this pin outputs "L". This pin outputs "L" during play.</td></tr>
<tr><td>19</td><td>TEST</td><td>MPU test terminal connected to Vss.</td></tr>
<tr><td>20</td><td>Vss</td><td>Common terminal (GND) of each input/output, power supply of MPU.</td></tr>
</table>

Pin No.	Pin name	Description				
		Input Mode				Output Mode (LED)
15	PE 0	——	——	——	——	HIGH SPEED BUSS.
2	PA 3	MS-2 SIGNAL IN	STOP-1 KEY IN	STOP-2 KEY IN	QUICK REVERSE-1 SIGNAL IN	NORMAL SPEED DUB
1	PA 2	MS-1 SIGNAL IN	——	PAUSE KEY IN	QUICK REVERSE-2 SIGNAL IN	PAUSE
42	PA 1	CBRS SW IN	HIGH SPEED DUBB. DUB KEY IN	REC MUTE KEY IN	DIRECTION-1 SW IN	REC MUTE
41	PA 0	BLANK SKIP SW IN	NORMAL SPEED DUB KEY IN	REC KEY IN	DIRECTION-2 SW IN	REC
39	PJ 3	TIMER PLAY SW IN	◁◁-1 KEY IN	◁◁ -2 KEY IN	CASSETTE-1 SW IN	REV.PLAY-2 ◁
38	PJ 2	TIMER REC SW IN	▷▷-1 KEY IN	▷▷-2 KEY IN	CASSETTE-2 SW IN	PLAY-2 ▷
37	PJ 1	⇄ SW IN	REV.PLAY-1 KEY IN	REV.PLAY-2 KEY IN	REC ENA-B SW IN	REV.PLAY-1 ◁
36	PJ 0	⟲ SW IN	PLAY-1 KEY IN	PLAY-2 KEY IN	REC ENA-A SW IN	PLAY-1 ▷
35	PI 3 ($\overline{KS3}$)	L	H	H	H	H
34	PI 2 ($\overline{KS2}$)	H	L	H	H	H
33	PI 1 ($\overline{KS1}$)	H	H	L	H	H
32	PI 0 ($\overline{KS0}$)	H	H	H	L	H
31	PG 3 ($\overline{DISP}$)	H	H	H	H	H
3	PB0 (REMOTE CONTROL INPUT D)	• Remote control input code table				
4	PB1 (REMOTE CONTROL INPUT C)					
5	PB2 (REMOTE CONTROL INPUT B					
6	PB3 (REMOTE CONTLOL INPUT A)					

D	C	B	A	Command
0	0	0	0	——
0	0	0	1	DECK 1,2 STOP
0	0	1	0	DECK 2, ◁◁
0	0	1	1	DECK 2,REV.PLAY
0	1	0	0	DECK 2,PLAY
0	1	0	1	DECK 2, ▷▷
0	1	1	0	DECK 2,PAUSE
0	1	1	1	DECK 2,REC
1	0	0	0	DECK 1, ▷▷
1	0	0	1	DECK 1,REV.PLAY
1	0	1	0	DECK 1,PLAY
1	1	0	0	DECK 1, ◁◁
1	1	0	1	——
1	1	1	0	——
1	1	1	1	——

EXPLODED VIEW-1 (FX-W990)

REF.NO.	PART NO.	DESCRIPTION
A	87-511-096-21	VFT1+3-10
B	87-081-785-01	VTT2+3-8
C	87-081-808-01	PW1.7-3.5-0.25
D	87-517-094-21	VFT2+3-6 (R)
E	87-067-054-01	VTT+3-6 (R)
F	87-081-531-01	QTT+3-6
G	87-357-074-21	VT2+2.6-8
H	87-067-277-01	UTT+3-6 (B)
I	87-321-096-21	QT1+3-10
J	87-081-511-01	VTT+3-6



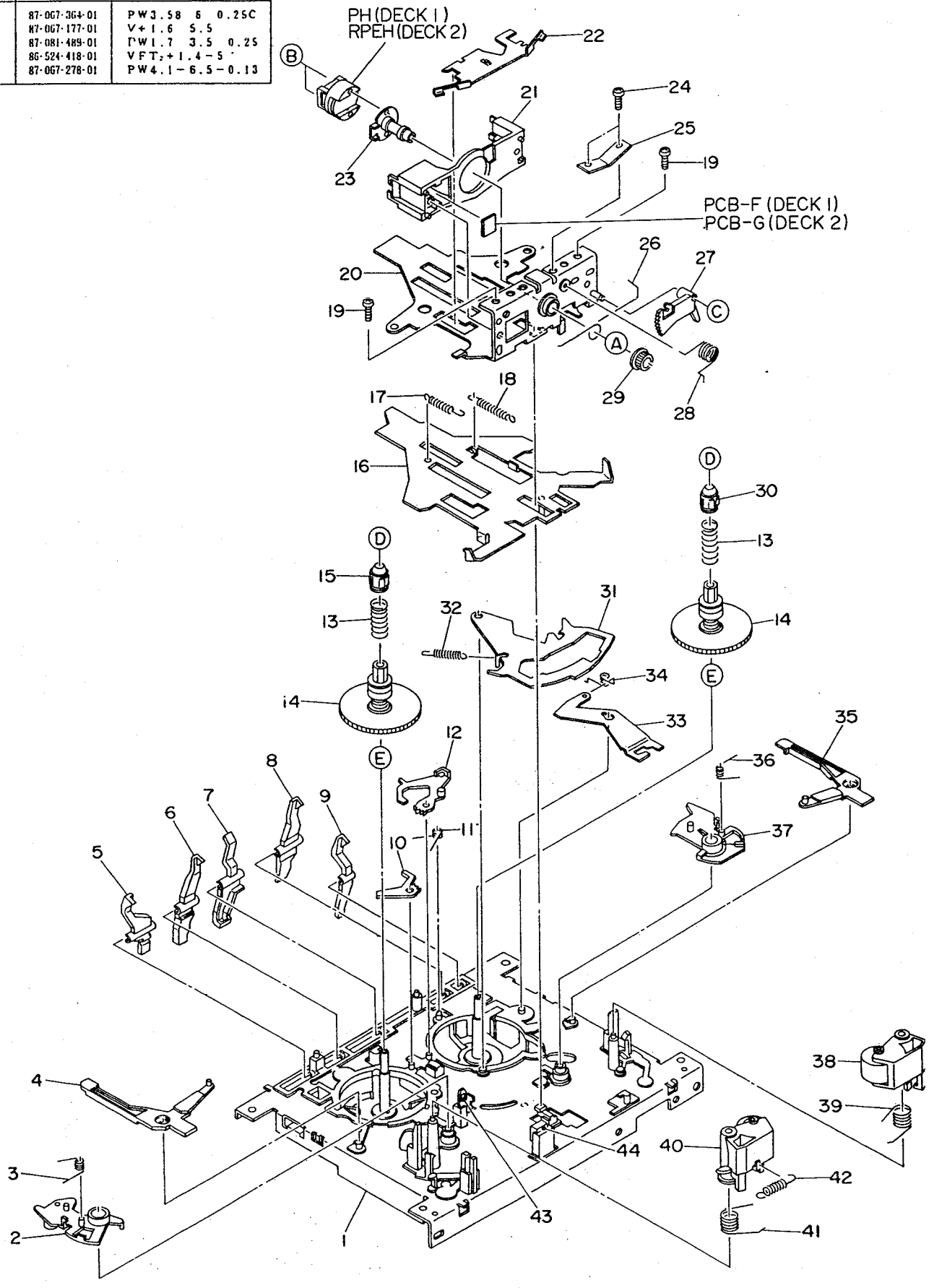
MECHANICAL PARTS LIST (FX-990)

※ Please order the all parts for this model to Japan.

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1-1	★82-203-002-110	CABINET,FRONT	FX-W1500	1
	1-2	★82-205-011-010	PANEL,CASSETTE NAME(4) 1	*	1
	1-3	★82-205-025-010	PANEL,CONTROL 4 EX	*	1
	1-4	★82-202-009-010	PUSH-KEY,PLAY 1		1
	1-5	★82-202-010-010	PUSH-KEY,DUBBING		1
	1-6	★82-205-013-010	PUSH-KEY,PLAY(4)	*	1
	1-7	★82-205-012-010	PANEL,CASSETTE NAME(4) 2	*	1
	1-8	★82-202-220-010	EARTH PLATE		1
	1-9	★82-202-005-010	PANEL,TOP	*	1
	1-10	★82-205-010-010	WINDOW,METER(4)	*	1
	1-11	★82-203-205-010	C-SPRING,NAME PLATE	FX-W1500	2
	1-12	82-203-012-110	CASSETTE BOX(3) 1	FX-W1500	1
	1-13	★82-205-006-010	WINDOW,CASSETTE(4)	*	2
	1-14	★82-205-004-010	PANEL, CASSETTE(4) 1	*	1
	1-15	★82-203-203-110	T-SPRING,EJECT 1	FX-W1500	1
	1-16	★82-202-217-110	P-SPRING,CASSETTE HOLDER		4
	1-17	82-203-013-110	CASSETTE BOX(3) 2	FX-W1500	1
	1-18	★82-205-005-010	PANEL,CASSETTE(4) 2	*	1
	1-19	★82-203-204-110	T-SPRING,EJECT 2	FX-W1500	1
	1-20	★82-202-031-010	KNOB,SLIDE B		5
	1-21	---	G CUSHION 10-20-5		3
	1-22	★82-202-028-010	CABINET,BOTTOM		1
	1-23	★87-040-185-110	COUNTER 4		1
	1-24	---	HOLDER,COUNTER		1
	1-25	82-461-318-210	BELT B,COUNTER		1
	1-26	82-534-264-010	GEAR,OIL-DAMP		2
	1-27	★82-202-216-110	LOCK PLATE,C-BOX		2
	1-28	★81-785-235-010	C-SPRING,LOCK PLATE		2
	1-29	★82-202-207-110	HOLDER R ASSY		1
	1-30	---	SHIELD PLATE A		2
	1-31	★82-205-016-110	CABINET(B),STEEL	*	1
	1-32	---	G CUSHION 10-25-5		2
	1-33	---	WIRE BINDER		1
	1-34	---	G CUSHION 10-10-10		1
	1-35	★82-202-206-110	HOLDER L ASSY		1
	1-36	---	PLATE,JACK		1
	1-37	★82-114-215-010	CORD BUSHING 13P		2
	1-38	---	AMP CHASSIS ASSY EX		1
	1-39	★82-132-010-010	FOOT		2
	1-40	★82-202-253-010	HOLDER TSP1		1
	1-41	★82-202-254-010	HOLDER TSP2		1

EXPLODED VIEW-2

Ref. No.	Part No.	Description
A	87-067-364-01	PW3.58 6 0.25C
B	87-067-177-01	V+1.6 5.5
C	87-081-489-01	PW1.7 3.5 0.25
D	86-524-418-01	VFT2+1.4-5
E	87-067-278-01	PW4.1-6.5-0.13

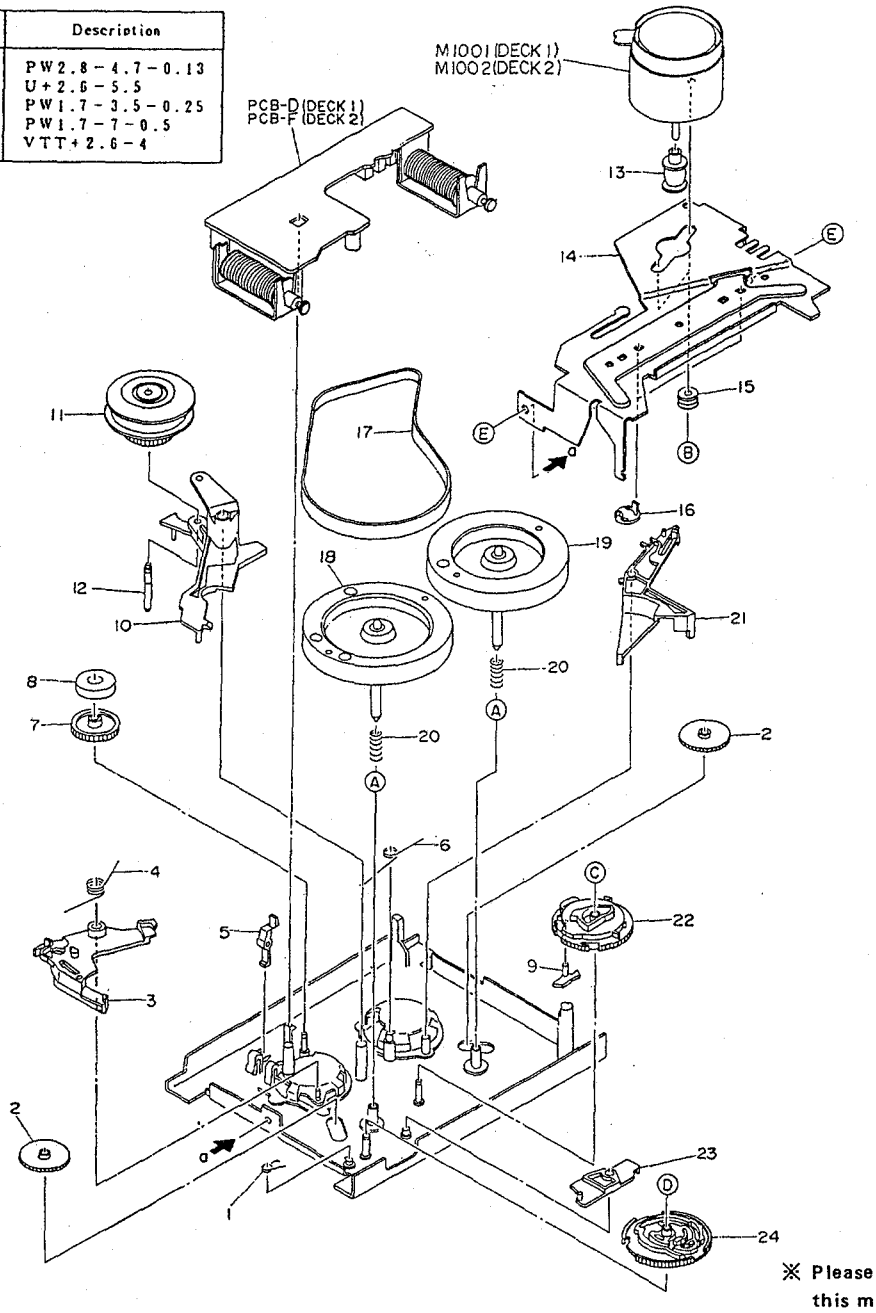


※ Please order the all parts for this model to Japan.

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	2-1	★86-535-201-210	OUTSERT CHASSIS ASSY		1
	2-2	★86-535-239-110	LEVER,PLAY R		1
	2-3	★86-535-283-010	T-SPRING,PLAY GEAR R		1
	2-4	★86-535-242-010	LEVER,EJECT BLOCKING L (DECK 1)		1
	2-5	★86-535-247-010	LEVER,REC BLOCKING A (DECK 2)		1
	2-6	★86-535-250-010	LEVER,METAL (DECK 2)		1
	2-7	★86-535-249-110	LEVER,CASSETTE DETECTION		1
	2-8	★86-535-254-010	LEVER,CHROME		1
	2-9	★86-535-248-010	LEVER,REC BLOCKING B (DECK 2)		1
	2-10	★86-535-252-010	LEVER,BRAKE R		1
	2-11	★86-535-276-010	T-SPRING,BRAKE		1
	2-12	★86-535-251-010	LEVER,BRAKE F		1
	2-13	★86-535-293-010	C-SPRING,REEL PLATFORM		2
	2-14	86-535-240-010	REEL PLATFORM R ASSY		2
	2-15	★86-524-218-110	STOPPER,REEL PLATFORM S		1
	2-16	★86-535-215-010	SLIDE PLATE ASSY		1
	2-17	★86-535-285-010	E-SPRING,SLIDE		1
	2-18	★86-535-286-010	E-SPRING,ACTUATING		1
	2-19	★86-535-310-010	ADJUSTMENT SCREW		2
	2-20	★86-535-212-110	ACTUATING CHASSIS ASSY (DECK 2)		1
	2-20	★86-535-351-010	ACTUATING CHASSIS PH ASSY (DECK 1)		1
	2-21	★86-535-237-310	GUIDE,TAPE		1
	2-22	★86-535-289-010	P-SPRING,ACTUATING		1
	2-23	★86-535-270-010	HEAD HOUSING ASSY		1
	2-24	★86-535-297-010	ADJUSTMENT SCREW,AZIMUTH		2
	2-25	★86-524-300-010	P-SPRING,AZIMUTH		1
	2-26	★86-535-298-010	T-SPRING,GUIDE		1
	2-27	86-535-246-110	GEAR,SEGMENT		1
	2-28	★86-535-290-010	T-SPRING,GEAR SEGMENT		1
	2-29	86-524-278-010	GEAR,HEAD HOUSING		1
	2-30	★86-524-233-110	STOPPER,REEL PLATFORM T		1
	2-31	★86-535-218-010	LEVER,DIRECTION ASSY		1
	2-32	★86-535-284-010	E-SPRING,LEVER DELECTION		1
	2-33	★86-535-225-010	LEVER,D SWITCH		1
	2-34	★86-535-277-010	T-SPRING,D SWITCH		1
	2-35	★86-535-243-010	LEVER,EJECT BLOCKING R (DECK 2)		1
	2-36	★86-535-282-010	T-SPRING,PLAY GEAR F		1
	2-37	★86-535-238-110	LEVER,PLAY F		1
	2-38	86-535-226-010	PINCH LEVER F ASSY		1
	2-39	★86-535-280-110	T-SPRING,PINCH F		1
	2-40	86-535-228-010	PINCH LEVER R ASSY		1
	2-41	★86-535-281-110	T-SPRING,PINCH R		1
	2-42	★86-535-287-110	E-SPRING,PINCH		1
	2-43	★86-517-353-010	SHEET		1
	2-44	★86-535-296-010	FELT 5-5-2		1

EXPLODED VIEW-3 (FX-W990)

Ref. No.	Part No.	Description
A	87-067-332-01	PW2.8-4.7-0.13
B	86-524-457-01	U+2.6-5.5
C	87-081-489-01	PW1.7-3.5-0.25
D	87-067-380-01	PW1.7-7-0.5
E	87-081-501-01	VTT+2.6-4



※ Please order the all parts for this model to Japan.

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	3-1	★86-535-291-010	T-SPRING,FR CAM		1
	3-2	86-535-259-110	GEAR,PLAY		2
	3-3	★86-535-230-110	LEVER,TRIGGER FR		1
	3-4	★86-535-278-010	T-SPRING,FR		1
	3-5	★86-535-253-010	LEVER,RELAY		1
	3-6	★86-535-279-010	T-SPRING,MAIN		1
	3-7	86-535-258-210	GEAR,IDLER		1
	3-8	★86-535-614-010	RING,MAGNET(4P)		1
	3-9	★86-535-308-110	LEVER,SELECT		1
	3-10	★86-535-233-010	LEVER,FR		1
	3-11	★86-535-301-010	SLIPDISC ASSY		1
	3-12	★86-535-235-010	SHAFT,FR		1
	3-13	★86-535-315-010	MOTOR PULLEY		1
	3-14	---	HOLDER,MOTOR		1
	3-15	★86-513-441-110	COLLAR		2
	3-16	★86-535-255-010	FLYWHEEL BEARING		2
	3-17	86-535-294-110	BELT		1
	3-18	86-535-264-010	FLYWHEEL F ASSY		1
	3-19	86-535-267-010	FLYWHEEL R ASSY		1
	3-20	★86-535-288-010	C-SPRING,FR		2
	3-21	★86-535-231-210	LEVER,TRIGGER PLAY		1
	3-22	★86-535-260-210	CAM,MAIN		1
	3-23	★86-535-223-210	LEVER,PAUSE		1
	3-24	★86-535-260-110	CAM,FR P		1